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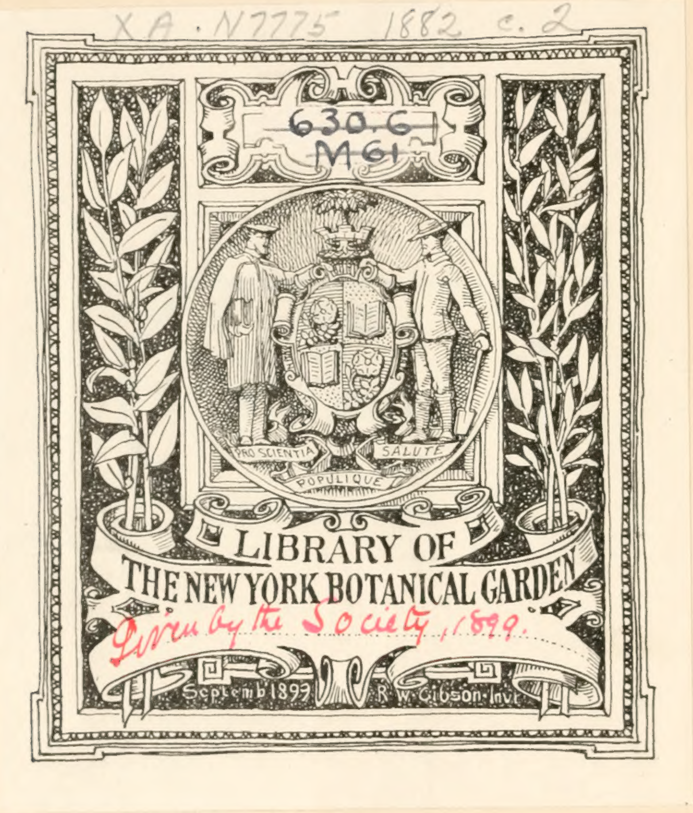

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TWELFTH ANNUAL REPORT

OF THE

SECRETARY

OF THE

STATE HORTICULTURAL SOCIETY

OF

MICHIGAN.

1882.

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REPORT OF THE SECRETARY

OF THE

MICHIGAN STATE HORTICULTURAL SOCIETY.

GRAND RAPIDS, Michigan, December 31, 1882.

TO JOSIAH W. BEGOLE, *Governor of the State of Michigan:*

I have the honor to submit herewith, in compliance with legal requisition, the accompanying Report of 1882, with supplementary papers.

Respectfully yours,
CHAS. W. GARFIELD,
Secretary of the Michigan State Horticultural Society.

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OFFICERS OF THE STATE HORTICULTURAL SOCIETY FOR 1883.

President—T. T. LYON, South Haven.
Secretary—CHAS. W. GARFIELD, Grand Rapids.
Treasurer—S. M. PEARSALL, Grand Rapids.
Librarian—THOMAS H. FORSTER, Lansing.

EXECUTIVE COMMITTEE.

JAS. SATTERLEE, Lansing, 3 years.
J. N. STEARNS, Kalamazoo, 3 years.
E. H. SCOTT, Ann Arbor, 2 years.
A. D. HEALY, South Haven, 2 years.
W. K. GIBSON, Jackson, 1 year.
JOHN ABBOTT, Lapeer, 1 year.

STANDING COMMITTEES.

On Fruit Catalogue—T. T. LYON, South Haven, Chairman; GEORGE C. McCLATCHEE, Ludington, for Northern Lake Shore; W. A. BROWN, Stevensville, for Southern Lake Shore; EVART H. SCOTT, Ann Arbor, for Central Michigan; E. W. COTTRELL, Detroit, for Eastern Michigan; PORTER BEAL, Rollin, for Southern Michigan.

On New Fruit—T. T. LYON, Chairman; G. H. LaFLEUR, Allegan; GEO. C. McCLATCHEE, Ludington; C. ENGLE, Paw Paw.

On Finance—E. H. SCOTT, JAMES SATTERLEE, J. N. STEARNS.

On Entomology—ALBERT J. COOK, Lansing.

On Landscape Gardening—R. HAIGH, Jr., Chairman.

On Vegetable Garden—Prof. W. W. TRACY, Chairman.

BRANCHES OF THE STATE HORTICULTURAL SOCIETY.

NAME OF SOCIETY.	SECRETARY.	ADDRESS.
Allegan Co. Pomological Society	A. J. Bracelin	Allegan.
Grand River Valley Hort. Society	Robert D. Graham	Grand Rapids.
Saugatuck and Ganges Pom'l Society	Henry Bird, Jr	Douglas.
Lawton Pomological Society	Chas. D. Lawton	Lawton.
Berrien Co. Horticultural Society	J. F. Comings	St. Joseph.
Oceana Co. Pomological Society	W. J. Canfield	Pentwater.
Benzie Co. Horticultural Society	J. W. Van Deman	Benzonia.
Lapeer Co. Horticultural Society	H. W. Davis	Lapeer.
Macomb Co. Horticultural Society	Alexander Grant	Utica.
Bay Co. Horticultural Society	Wm. Corbin	West Bay City.
Adrian Horticultural Society	W. Owen	Adrian.
Eaton Co. Horticultural Society	S. R. Fuller	Eaton Rapids.
Holland Colony Pomological Society	I. Marsilje	Holland City.
Greenville Horticultural Society	John E. Taylor	Otisco.
Jackson Co. Horticultural Society	R. T. McNaughton	Jackson.
Ingham Co. Horticultural Society	Geo. W. Parks	Lansing.
Mason Co. Horticultural Society	L. W. Rose	Ludington.
Muskegon Co. Horticultural Society	H. H. Holt	Muskegon.
Washtenaw Co. Pomological Society	Jacob Ganzhorn	Ann Arbor.
Barry Co. Horticultural Society	Eugene Davenport	Woodland Center.
Genesee Co. Horticultural Society	A. L. Aldrich	Flint.
Lenawee and Hillsdale Hort. Society	C. B. Stowell	Hudson.
Spring Lake Horticultural Society	Chas. F. Wassen	Spring Lake.
South Haven and Casco Pom. Society	J. G. Ramsdell	South Haven.
Ionia Co. Horticultural Society	J. H. Kidd	Ionia.
Manistee Co. Horticultural Society	J. V. P. Mukautz	Manistee.
Oakland Co. Horticultural Society	I. B. Merritt	Pontiac.

OFFICERS OF THE MICHIGAN STATE AGRICULTURAL SOCIETY FOR THE YEAR 1883.

President—HENRY FRALICK, Grand Rapids.
Treasurer—A. J. DEAN, Adrian.
Secretary—J. C. STERLING, Monroe.

EXECUTIVE COMMITTEE.

Terms Expire January, 1884.

ABEL ANGEL, Bradley, Allegan Co.
D. W. HOWARD, Pentwater, Oceana Co.
H. O. HANFORD, Plymouth, Wayne Co.
F. L. REED, Olivet, Eaton Co.
A. F. WOOD, Mason, Ingham Co.
F. V. SMITH, Coldwater, Branch Co.
J. Q. A. BURRINGTON, Tuscola, Tuscola Co.
M. P. ANDERSON, Midland, Midland Co.
JOHN GILBERT, Ypsilanti, Washtenaw Co.
C. A. HARRISON, Paw Paw, Van Buren County.

Terms Expire January, 1885.

J. M. STERLING, Monroe, Monroe Co.
WM. BALL, Hamburgh, Livingston Co.
J. L. MITCHELL, Jackson, Jackson Co.
A. O. HYDE, Marshall, Calhoun Co.
W. H. COBB, Kalamazoo, Kalamazoo Co.
E. W. RISING, Davison Station, Genesee Co.
PHILO PARSONS, Detroit, Wayne Co.
I. H. BUTTERFIELD, Jr., Port Huron, St. Clair Co.
JOHN LESSITER, Jersey, Oakland Co.
WM. CHAMBERLAIN, Three Oaks, Berrien Co.

EX-PRESIDENTS.

GEO. C. MUNRO, Jonesville, Hillsdale County.
M. SHOEMAKER, Jackson, Jackson Co.
JAMES BAILEY, Birmingham, Oakland County.
H. G. WELLS, Kalamazoo, Kalamazoo Co.
W. G. BECKWITH, Cassopolis, Cass Co.
W. J. BAXTER, Jonesville, Hillsdale Co.
GEO. W. GRIGGS, Grand Rapids, Kent County.
CHARLES KIPP, St. Johns, Clinton Co.
E. O. HUMPHREY, Kalamazoo, Kalamazoo Co.
W. L. WEBBER, East Saginaw, Saginaw County.
GEO. W. PHILLIPS, Romeo, Macomb Co

MICHIGAN STATE GRANGE.

OFFICERS FOR 1883.

MASTER—C. G. LUCE, Gilead.
SECRETARY—J. T. COBB, Schoolcraft.
TREASURER—S. F. BROWN, Schoolcraft.

EXECUTIVE COMMITTEE.

J. Q. A. BURRINGTON, Chairman, Tuscola.
H. O. PLATT, Ypsilanti.
JOHN PORTER, Grand Rapids.
THOMAS MARS, Berrien Center.
WILLIAM SATTERLEE, Birmingham.
THOMAS F. MOORE, Adrian.
J. G. RAMSDELL, Traverse City.
C. G. LUCE, President. } *Ex-officio.*
J. T. COBB, Secretary. }

CONSTITUTION

OF THE

MICHIGAN STATE HORTICULTURAL SOCIETY.

ARTICLE I.—NAME, TERRITORY, AND OBJECTS.

The name of the society shall be the Michigan State Horticultural Society; and its territory shall be the State of Michigan. Its objects shall be the development of an adequate appreciation of the peculiar adaptation of the soils and climate of the State to the pursuit of horticulture in all its branches; and the collection and dissemination of information bearing upon the theory and practice of the same, as well as upon the arts and sciences directly or indirectly associated therewith, or calculated to elevate or improve the practice thereof.

ARTICLE II.—OFFICERS AND MODE OF ELECTION.

The officers of the society shall be a President, a Vice President in and for each county of the State, as far as shall be found necessary and practicable; a Secretary and a Treasurer, together with an Executive Board of six members, aside from the President, Secretary, and Treasurer, who shall be *ex officio* members of said board. The officers shall be elected by ballot.

ARTICLE III.—A QUORUM.

Four members of the Executive Board shall constitute a quorum for the transaction of business at any meeting of said board: *Provided*, That each of the members thereof shall have been notified, in the usual manner, of the time, place, and object of such meeting.

ARTICLE IV.—ANNUAL MEETING AND ELECTION OF OFFICERS.

The annual meeting of the society, for the election of the officers specified in Article II., shall occur on the first Wednesday of December in each year, and the officers then elected shall enter upon the discharge of their duties as such, on the first day of January next ensuing; but in case of a failure to elect at that time, such election may be held at a subsequent time, at an adjourned meeting, or at a meeting of the society called for that purpose, in the usual manner.

ARTICLE V.—TERMS OF OFFICE.

The officers specified in Article II. shall hold their offices till the thirty-first day of December of the year for which they were elected, and thereafter until their successors shall have been elected, and shall have signified to the Secretary their acceptance: *Provided*, That the terms of office of the six members of the Executive Board shall be so arranged that but two regular vacancies shall occur in each year.

ARTICLE VI.—ANNUAL AND LIFE MEMBERS.

Any person may become a member of the society for one year by paying to the Treasurer the sum of one dollar; but all annual memberships shall expire on the thirty-first day of December of the year for which they were taken, except as may be provided by the by-laws. Any person may become a life member by the payment at any one time of the sum of ten dollars into the treasury of the society.

ARTICLE VII.—AMOUNT OR LIMIT OF PROPERTY.

The society may hold real and personal estate to an amount not exceeding twenty thousand dollars.

ARTICLE VIII.—BY-LAWS.

By-laws for the government of the society shall be framed, and when needful, amended by the Executive Board; but changes thereof may be at any time proposed by the society in general meeting.

ARTICLE IX.—AMENDMENTS.

This constitution may be amended at any regular meeting of the society by a vote, by ballot, of two-thirds of all the members present, and voting: *Provided*, That notice of such proposed amendment, specifying its purport, shall have been given at the last previous regular meeting.

BY-LAWS OF THE MICHIGAN STATE HORTICULTURAL SOCIETY.

I.—THE PRESIDENT.

1st. The President shall be the executive officer of the society, and of the Executive Board; and it shall be his duty to see that the rules and regulations of the society, and of the Executive Board, are duly enforced and obeyed.

2d. He may, in his discretion, and in the lack of needful rules, during the recesses of the society and of the board, prescribe rules for the management of the interests or business of the society, such rules to continue in force till the next session of the Executive Board, and until by its action they shall have become no longer necessary.

3d. He shall act in conjunction with the Secretary in the preparation of programmes, or orders of business for the sessions of the society; and in the devising of plans and processes for the maintenance of its interests.

4th. He shall have the best interests of the society at heart, and shall lead in forwarding any and all enterprises calculated to add to its permanency, or to increase its usefulness, and establish it more firmly in the public confidence.

II.—VICE PRESIDENTS.

1st. The President may, at any time, call upon any one of the Vice Presidents to occupy the chair and conduct the exercises of the meeting.

2d. In the absence of the President, any Vice President may assume the chair and conduct the exercises of the sessions.

3d. It shall be the duty of the Vice Presidents, according to the best of their ability and opportunity, to aid in increasing the membership of the society in their several localities, and in bringing its objects and interests home to the apprehension of their people.

III.—THE SECRETARY.

1st. The Secretary shall be the recording, corresponding, and accounting officer of the society, and he shall also be, jointly with the business committee, its financial and auditing officer.

2d. He shall incur no expenditure of a large or doubtful character, except with the sanction of the Executive Board, or of the business committee.

3d. He shall submit all bills or claims against the society to the business committee for approval, and endorsement to that effect, before drawing his order upon the Treasurer for the payment of the same.

4th. He shall attend all meetings of the society, and of the Executive Board, and shall keep a faithful record of their proceedings.

5th. He shall sign all certificates of membership, and all diplomas and certificates of merit awarded by the society.

6th. He shall have charge of the society's books and papers, excepting only such as by the advice or direction of the Executive Board shall be placed in charge of the Librarian, and he shall be responsible to the board for the safe keeping of the property placed in his charge.

7th. He shall be the custodian of the seal of the society, and shall have authority to affix the same to documents when needful.

8th. He shall seek, by all suitable means, to secure the fullest announcement of the meetings of the society in this State, as well as in adjacent States, when such shall be found desirable.

9th. He shall, as far as practicable, cause the transactions of the society together with such valuable or interesting papers as shall be read at its sessions, to be properly published, and thus placed within reach of the people of the State.

10th. It shall also be his duty, yearly, to prepare for publication the annual report of the society, together with such other matter as he shall deem proper, —he being aided in the selection of such matter by an advisory committee of the Executive Board.

IV.—THE TREASURER.

1st. All the funds of the society shall be paid into the hands of the Treasurer.

2d. He shall disburse the moneys of the society that shall come into his hands only upon the order of the Secretary, countersigned by the President.

3d. He shall keep the moneys received by the society for life memberships as a distinct fund, and shall invest the same under the advice and direction of the Executive Board, applying only the interest accruing thereon to the purposes of the general fund.

4th. Immediately upon assuming his office, and before entering upon its duties, he shall execute to the society an official bond with sufficient sureties, conditioned for the safe keeping and disbursement of the moneys of the society, and for the proper discharge of the farther duties of his office, in such sum as shall be specified by the Executive Board. Such bond shall receive the approval of the President, and shall be deposited with the Secretary.

5th. He shall, at the close of each year, report to the Executive Board the amount of money that shall have come into his hands during the year, the sources from which it has been derived, and the disposition made of the same.

V.—THE LIBRARIAN.

1st. The Librarian shall have the custody of the library of the society. He shall be appointed by the Executive Board, and may be displaced at its pleasure.

2d. He shall act jointly with the Secretary in the care and arrangement of the same, and in the reception, custody, and disposal of the volumes of transactions annually supplied to the society by the State.

3d. He shall have the custody of the rooms assigned to the society at the State capitol, together with such books and other property as the society or the board shall direct to be deposited therein.

4th. He shall report annually, at the close of the year, to the Executive Board the amount and condition of the property in his hands.

VI.—THE EXECUTIVE BOARD.

1st. The Executive Board shall enact all rules and regulations for the management of the affairs of the society, determine the salaries of its officers, and assume the control and management of its exhibitions.

2d. It shall have power to displace any officer of the society for neglect of duty or abuse of position, and to fill all vacancies by appointment, to continue till the next annual election.

3d. The board shall hold four regular sessions during the year, to occur at the times and places for the regular meetings of the society.

4th. Other meetings may be called by the Secretary, under the advice or direction of the President, or of a majority of its members, at such times and places as may be deemed most convenient; but in all such cases, each member must be notified of the time, place, and object of such meeting.

5th. It shall be the duty of the board to carefully guard the general interests of the society, to watch over its finances, and to provide for its necessities as they shall arise.

6th. All important measures shall be submitted to this board, but they may by the board be re-submitted to the society with recommendations.

7th. The board shall at the annual meeting submit through the secretary, in connection with the reports of officers, such farther report upon the condition, interests, and prospects of the society as it shall judge necessary or expedient.

8th. Two members of the Executive Board are to be elected each year, to hold the office for three years. but if any such member shall absent himself from two or more consecutive meetings of the society, and of the board, without reason satisfactory to the board, the said board may, in its discretion, consider the office vacant, and proceed to fill such vacancy by appointment, to continue till the next annual election.

VII.—THE BUSINESS COMMITTEE.

1st. It shall be the duty of the Executive Board, annually, upon entering upon the duties of the new year, to appoint, from their own number, three members, who shall constitute a Business Committee for the year.

2d. All accounts or claims against the society, when presented to the Secretary for payment, shall, before payment, receive the sanction and endorsement of the Business Committee.

3d. Such claims shall be submitted to this Committee and approved in duplicate; one copy to remain with the Secretary as his warrant for the payment of the same, and the other to be transmitted by him to the President, along with his order upon the Treasurer, as his warrant for countersigning the same.

4th. It shall be the duty of the Business Committee, upon application of the Secretary, during the recess of the Executive Board, to advise with him as to the expediency of making any contemplated but questionable expenditure for which occasion may arise during such recess.

VIII.—STANDING COMMITTEES.

1st. There shall be a Standing Committee on Revision of the Catalogue, to be composed of one member from each of the five districts into which the State is, for this purpose, divided, with one member chosen from the State at large, who shall be the chairman of the Committee.

2d. Each member of said Committee (except the chairman) is empowered and expected to choose a sub-committee for his district, of which he shall be chairman.

3d. It shall be the duty of each sub-committee to collect and report, each year, to the general chairman, such facts respecting fruit culture in the district as shall promise to be of value in the revision of the catalogue.

4th. There shall be a Standing Committee on New Fruits, to consist of a chairman, with as many associates as such chairman shall find it desirable to appoint.

5th. Such other standing committees may, from time to time, be appointed by the Executive Board as, in its discretion, it shall deem desirable or necessary.

6th. All standing committees are expected to report at the annual meeting in December any information of value to the society or its members that may have come to their knowledge during the year, as well as any scientific theories, deductions or facts that, in their opinion, may be useful in advancing the objects for which the society is laboring.

IX.—LIFE MEMBERSHIP FUND.

1st. All moneys coming into the treasury of the society in payment for life memberships shall constitute a perpetual fund, to be known as the life membership fund.

2d. The principal of this fund shall be invested by the Treasurer under the advice and direction of the Executive Board.

3d. All interest accruing upon any portion of said fund shall constitute and become part of the fund of the society devoted to the payment of its ordinary expenses.

X.—MEETINGS OF THE SOCIETY.

1st. The society shall hold its first regular meeting for the year during the month of January or February for the inauguration of the officers chosen at the annual meeting held the previous December, as provided in Article IV of the Constitution, and also to arrange its plans of operations for the year.

2d. Its second regular meeting shall be held in the month of June at such date as shall best accommodate an exhibit of the early summer fruits.

3d. Its third regular meeting shall be at its annual exhibit of autumn and winter fruits, in the month of September or October.

4th. Its fourth regular meeting shall occur in connection with its annual election of officers, on the first Wednesday of December, as provided in Article IV of the Constitution.

5th. The times and places for the occurrence of these regular meetings, (excepting only the *time* of the annual meeting) shall be determined by the Executive Board.

6th. Other meetings may be called by the Secretary, under the advice or direction of the members of the Executive Board, at times and places by them deemed expedient.

7th. In case of the calling of a special meeting for the election of officers of the society, in consequence of any failure to elect at the annual meeting, as provided in Section IV of the Constitution, all persons entitled as members to vote at such annual meeting shall be considered as retaining such membership for such purpose until such election and until such officers so elected shall have been inducted into office.

XI.—RULES FOR DISCUSSIONS, ETC.

1st. The deliberations and discussions of the society shall be conducted in accordance with ordinary parliamentary usage.

XII.—AUXILIARY SOCIETIES.

1st. The society shall in all reasonable and proper ways encourage the formation of local horticultural or pomological societies auxiliary to this society in all such counties or other municipalities of this State as shall afford a reasonable prospect that they will be able, effectively, to maintain the same.

2d. It shall be the policy of this society in supervising the organization of such local auxiliaries to secure an identity of constitutional provisions throughout, and in so doing to insure harmony among them; but at the same time it will not discourage the including by them of special or local objects in cases in which such shall be found desirable, so long as the introduction of the requisite provisions therefor into the constitution and by-laws of the auxiliary society shall not be deemed likely to interfere with the harmonious working of the whole.

3d. Any person may become a full member of an auxiliary society, for one year, by paying into its treasury the sum of one dollar; and a compliance with the provisions of clause fifth of these by-laws shall constitute him also a member of this society, for the same term.

4th. The wife, and the resident, single or unmarried daughters of any full member, may also become members of such auxiliary society upon the payment of fifty cents each: Provided, that in such case, such entire family shall become entitled to a single copy, only, of the current volume of the transactions of this society.

5th. On receipt of the names of such members, with the required fees, the Secretary shall immediately transmit their names and postoffice addresses, together with half the membership fee of each, to the Secretary of this society, who shall record the same and pay the money into the treasury for the benefit of the general fund.

6th. It shall be the duty of the Secretary, on receipt of such remittance, with list of members, to supply such auxiliary society with a certificate of membership in this society for one year, together with a copy of the current volume of transactions for each full member so remitted for.

7th. The proceedings of such auxiliary societies shall, at the close of the year, be forwarded, in succinct form, to the Secretary of this society, to be by him incorporated into the annual volume of transactions, accompanied by a list of its members for the year.

8th. The auxiliary societies shall, as far as practicable, be made the medium for the distribution of the annual volumes of the transactions of the society; the nuclei for its meetings, and the means of creating interest therein, as well as the means of collecting such facts or other information or material as shall, from time to time, become needful or desirable in the conducting of its various operations.

XIII.—AMENDMENTS, ADDITIONS, SUSPENSIONS.

1st. Amendments or additions to these by-laws may be made by a majority vote of the Executive Board, at any meeting; but if objection shall be made the same shall "lie upon the table" till the next regular meeting of the Board.

2d. These by-laws, or any one or more of them, may be suspended for the time, by order of a majority of all the members of the society present and voting.

3d. A proposition, in the general meeting of the society, for an amendment or addition to these by-laws shall be referred to the Executive Board for consideration and decision; but the society may submit therewith its advice or request.

4th. All amendments of the constitutions and by-laws of auxiliary societies shall, before they shall take effect, be submitted to the Executive Board of this society, by whom their approval or rejection shall be considered upon the principle provided in section XII, clause 2d, and the determination of said Executive Board shall be final and binding upon the auxiliary society.

PROCEEDINGS OF THE WINTER MEETING,

HELD IN HUDSON, FEBRUARY 28, 1882.

Early in February the following circular with scheme of topics was sent out over the State, and was copied by a large number of papers in and out of Michigan:

Hudson is on the Lake Shore and Michigan Southern railway, at a point on the line between Lenawee and Hillsdale counties. The Farmers' Union of this place has invited the State Horticultural Society to join it in an Institute on the last day of February and the first two days in March. It will be an open meeting. Everybody is invited to attend and help make the gathering a success. Members of the State society and its branches will be entertained, and the Farmers' Union hopes and expects to have a large attendance of fruit growers from abroad. The Institute will open in the opera house, February 28, at 1 o'clock P. M., and close with an evening session March 1.

It is expected that all who come will be willing to contribute something to the discussion of the topics in the programme, and the secretary would be pleased to receive letters or short papers from any who see this programme, and will not be able to attend in person.

It is desirable that there be a good show of fruit, especially of novelties or unnamed sorts, also of dried fruit, canned fruit, and jellies. Any contrivance or implement adapted to saving labor in horticultural operations will be given proper attention, and it is quite desirable that fruit packages of various styles be upon exhibition.

We hope to have a large attendance from the counties joining Lenawee and Hillsdale, and all who come from a distance will be well received and cared for.

The following analysis of topics is given to aid in securing information from men and women who have had experience in the direction suggested by any of the sub-topics:

SCHEME OF TOPICS.

A—PRIMARY HORTICULTURE.
  1. Seed growing.
  2. Michigan nursery stock.
  3. The children's garden.

B—MECHANICAL HORTICULTURE.
  1. Implements.
  2. Buildings.
  3. Packages.

C—Horticultural Education.

1. In the schools.
2. In the home.
3. Apprenticeship.
4. In the college.
5. In associations.
6. Experience and observation.

D—Horticulture as an Adjunct of the Farm.

1. The orchard.
2. The garden.
3. About the house.
4. In the house.
5. Upon the highway.

E—Pomology and the Pocket Book.

1. The market—how to reach and manipulate it?
2. Honest packing.
3. The knife—when and how to use it?
4. Advertising at Fairs.
5. Fruit raising for money as a part of mixed husbandry.

It will be seen that there are but five general topics for discussion, but we want to get information upon any and all the subjects named in the scheme. If you cannot be present, send me a letter or a postal card with observations or experiences, or facts to be presented at the meeting.

Local committees on reception, entertainment, exhibit, and music, have already been selected. All who are to attend from outside of Hudson and vicinity should drop a postal card to Mr. C. B. Stowell, Hudson, Michigan, or to the secretary of the State society.

The doors will be open to all who desire to receive or are willing to impart information upon Horticulture and Pomology.

CHAS. W. GARFIELD, *Secretary,*
Grand Rapids, Michigan.

The publication of the above scheme created a large interest in the meeting, and the attendance throughout was large even although the weather was very inclement the first day.

The meeting convened in Fowle's Opera House at 1 o'clock P. M., February 28, as originally planned, with President John Harkness, of the Farmers' Union, in the chair. After prayer by the Rev. D. R. Shier, Dr. Smart, president of the village, gave a cordial welcoming address, which was responded to appropriately by President Lyon.

The general subject for the afternoon was "Mechanical Horticulture," upon which Mr. S. W. Dorr led with a paper entitled

BUILDINGS FOR KEEPING WINTER FRUIT.

This subject has engaged my attention for a number of years, and I have given much time and thought to it, hoping thereby to subserve my palate and pocket book at the same time.

I take it for granted that many of our apple orchards are not considered a profitable investment; that they are not as remunerative as they ought to be, considering the time and labor expended on them. In proof of this assertion let me call your attention to a fact that many of you cannot fail to have observed in passing through the country: Many of our farmers are cutting down or digging out their apple orchards, not culling, but practicing indiscriminate slaughter. Let us look for the cause of this state of affairs. Formerly our farmers planted an orchard to supply their families with fruit; soon they had plenty and a surplus, which was readily disposed of in our rapidly growing towns and cities at remunerative prices. Large additions were made to our orchards with a view to supply the immigrants, which were fast pouring in and building villages and cities in our fertile State. Eventually our hopes were realized,—we had a heavy surplus of fruit to dispose of; but the increase of our productive orchards had far outstripped the increase of population, and emigration, which was now flowing through our State and settling in the northwest, the great granary of the world, led us to see that the demand had flown to the west. Thus matters stood in southern Michigan in 1876 and 1878, with the finest crop of winter fruit in abundance and the price only sixty cents per barrel.

For the orchardist who has 5,000 bushels of apples lying in piles in his orchard, with no market, at the near approach of winter, there is a problem to solve. Something must be done. The roaring winds and beating sleets upon his window pane may drive sleep from his eye-lids, or the enthusiastic howls of the middle-man shouting frantically "fruit culture overdone" may serve for a time to discourage and muddle his unsettled mind, but brings no answer to the all-important question, In seasons of great abundance, how shall we get a fair price for our fruit?

But here is a fact that no well-informed person will deny. In our productive seasons, when fine winter fruit "goes begging" in the fall, it is a well-known fact that all really fine fruit is readily taken in spring in our large towns and cities at satisfactory prices. In April and May solid fruit is always sought for, and the supply is never equal to the demand. Then the matter of prices resolves itself into a question of time only, How can we manage to keep our winter fruit for a spring market? The ordinary farmer's cellar is inadequate. Various patent cooling rooms and refrigerating store rooms have been built for the purpose of keeping apples, with varied success.

I have taken every possible means to gain information in regard to the workings of the various houses constructed for keeping fruit. I have turned the subject over and over again a thousand times in my own mind, and endeavored to view it from every possible stand-point, and have found nearly all such structures objectionable in some points. I came to the conclusion, in the autumn of 1880, to build a house in some points like others, and in many points unlike anything heretofore constructed for the purpose. I lay no claim to perfection, and what I have done in this direction will serve only as a basis, or the stepping stone for future operations.

My house is built on the principle of what is called the "cold air" system, using no ice, or artificial heat in regulating the temperature, and involving no new principle or discovery; merely putting into practical use what has long been known, to wit: In order to preserve fruit any great length of time the store-room must be frost-proof, and kept at a low, even temperature, three or four degrees above freezing, with sufficient ventilation to carry off all moisture and impurities that may accumulate in the room. With a room constructed for this purpose, with a limited amount of judgment and practical knowledge, our success still depends upon a score of other conditions and contingencies.

My house is built in the side of a hill descending to the northeast, 24 x 42 feet, and two and a half stories high. The lower story is built of stone, the walls of which are two feet in thickness, and where exposed to the north they are lined with four-inch brick walls. The slat floor, two feet above ground, is supported by stone piers. The upper story and a half is built of wood, triple walls fifteen inches in thickness, ten inches of which is filled with saw-dust. There is an air space of two inches next to the inner ceiling on every side of the room. The floor is made of slats similar to the one below. The attic or third story floor is covered with sawdust two feet in thickness, and is used for storing ladders and various horticultural implements.

The doors are all double, the outer swinging out and the inner swinging in. The windows are provided with close shutters. There is also a frame-work in the center extending from the stone piers in basement to the third floor, for support. This brings us to the most important part of the house, the ventilation, which is by means of twenty ten-inch sewer tile laid in the walls directly beneath each floor, for the purpose of admitting cold air; these have close fitting lids of sheet-iron, which can be removed at pleasure. There is also a ventilating pipe of sheet-iron two feet in diameter, in the center, extending from an opening in the third floor, through the attic and roof and ten feet above, with a valve which can be opened and closed at will. Upon this pipe is a hood to exclude storms.

I have 1,000-bushel crates, which are filled with fruit and piled one upon the other like bricks in a wall, to form bins along the aisles. The balance of the fruit is deposited in the bins in bulk on both upper and lower floors, until the house is filled. There should be a thermometer hanging in each fruit room, also one on the outside. Before cold weather sets in the space between the double doors, also the space between the windows and shutters should be filled with sawdust to exclude frost and light, the only entrance in winter being through a south door, protected by an ante-room, which is not packed like the other rooms.

In working the house the attendant should be actuated principally by the indications of the thermometer; his judgment will soon, however, decide, upon entering the house and examining the condition of the fruit, what course to pursue. To illustrate: Were we to enter our fruit room on a fine winter day, when the outside temperature indicates 20° below freezing, while the thermometer indoors indicated 10° above, or a difference of 30°, if you desired to keep the room as near as possible to 35°, you would at once open the valve in the ventilating pipe for the escape of the warm air in the upper part of the room, and at the same time open all the flues at the base of the building to admit cold air to fill its place. Thus, in a few hours, you would reduce the temperature to the point desired, when the flues should all be closed. On the contrary, should you find the fruit room cooler than the mean temperature outside you would let it remain closed for the present and await a more favorable opportunity, the object in view being to hold the cold air inside, when it is warmer outside. When very cold outside admit just enough to obtain the desired temperature, and no more. You will be very agreeably surprised to learn how easy a matter it will be to keep such a room for months within a very few degrees of any desirable temperature without any artificial means.

On referring to my memoranda I find that one year ago we were able to hold my house for five months within 3° of freezing; also, when the atmospheric temperature rapidly changed, 60° in twenty-four hours, the change in the fruit-room was imperceptible, too slight to note. Again, in January, 1881, the temperature fell for five days in succession to from 6° to 20° below zero, yet in our fruit room in those five days the temperature changed scarcely one degree. And here again is a fact worthy of notice. The larger the fruit-room, and the greater the bulk of fruit in store, the less liable will it be to be affected by any sudden changes, either of cold or heat, providing the house is properly built and skillfully managed.

From my past experience I am of the opinion that good solid winter fruit, properly managed, can be kept in a house of this description until mid-summer; yet it would be very unwise to hold our apples past a certain point in spring when their market value depreciates. By a careful review of the Chicago markets for a term of years I have ascertained that an average of the highest prices is about the 20th of May; from that time on winter apples are not so eagerly sought for. My last car, the past season, was shipped about the middle of May to Chicago. Although prices were low all through, yet I realized 300 per cent for seven months' storage.

As we are rapidly passing over this subject many important questions naturally suggest themselves. What are the organic substances of which the different varieties of fruit are composed? What elements and agencies are requisite to mature fruit? What agencies are requisite to ripen fruit? At what stage of ripening should fruit be gathered to obtain the best results from its keeping qualities? To what degree of cold or heat can fruit be subjected and not destroy its keeping qualities? What are the principal causes which bring about premature decay in winter fruit? All these questions and their solutions have an important bearing upon the subject before us.

By experimenting we have ascertained to a certainty that winter apples can be kept to almost an indefinite length of time in a refrigerator. (By this term refrigerator I wish to be understood as referring to a house which is constructed in such a manner as to be able to maintain continually a very low temperature by means of large quantities of ice above the store room.) But supposing we can keep our fruit one, two, or three years, what have we gained, unless its market value is increased, unless its eating and culinary qualities are preserved or maintained? Can we expect to hold over a cargo of fruit in good condition for sale from the fruitful to the unfruitful season, at a gain? It is impracticable; it can't be done.

The fact is, there are certain limits beyond which we cannot reasonably expect to succeed. Strawberries can and have been kept, the past season, fifteen days in fair condition. We have eaten them seven weeks after picking, but their flavor was gone; nevertheless they were strawberries. My friend Conklin kept Early York peaches thirty days, and then exhibited them at the a county fair four days, and yet they were in fair condition. We exhibited seven varieties of peaches at the fair in October last, a quantity of which I kept to Christmas, in not very fair condition either.

To illustrate: We have before you two or three varieties of summer apples which were kept during the fall and early winter in a refrigerator; since that time in my cooler. Although, as you see, in fair condition, yet I presume their usually excellent qualities are considerably impaired by the too low temperature of the refrigerator, from which we may infer that although the fruit may never have been frozen, it may have been chilled to such an extent as to render it nearly worthless. I am aware, my friends, that I may meet opposition on this point by refrigerator men, yet I think I can substantiate my point.

The theory is this, that the chilling process has in a great degree the same effect upon the fruit that frost has upon apples slightly buried in the ground in winter,—when it becomes exposed to atmospheric influences it soon decays. The question is often asked, why will not slightly frosted fruit keep? If we examine the component parts of an apple with a microscope we shall observe the fluid-sacs packed closely together, similar to comb in honey. If these minute sacs or tissues are burst, the fluids become mingled with the fibrous constituents, and undoubtedly in some measure neutralized by the action of the frost, so that as soon as it comes in contact with warm air decomposition immediately commences. Apples improperly handled and bruised are rendered useless for long keeping in the same manner, or the codling moth cutting its way through the tissues and burrowing within its walls has the same effect, decay beginning sooner or later at the very point fractured; this probably you all have observed, that wormy apples very soon decay, and if partially decayed, always at the point punctured by the insect.

We are told it is a very easy thing to keep a quantity of fruit until spring. Indeed, that it is no trouble at all. This is not my experience, although some people are not as easily troubled as I am. We are also told that when our fruits are all properly stored away, a large quantity can be treated with a pound package of what they call ozone, which is a disinfectant, and fruit so treated will keep most any length of time. The package will only cost you two dollars, and it is very cheap at that. Analyzed, this compound proves to be no ozone at all, only charcoal, sulphur, and a little cinnamon; of course it is cheap, a cheap article. And my advice is even cheaper: Beware of the wily, patent-right man; beware of easy things. It is a very easy thing to fall into a ditch, but it is a very uneasy position. Some people have gone into fruit-culture for ease, and have found it a very easy matter to make it a—failure. The fact is, labor has its reward; and if finally we succeed in keeping our fruit for a spring market, we have accomplished much. If we succeed, it will be at the cost of brain, at the cost of muscle, at the cost of observation and experience, and some money.

But in conclusion, Mr. President, as I endeavor to comprehend the great and grand work of the State Horticultural society for the past ten years since I first met with you in South Haven in 1872, and as I try to apprehend the future labors dependent upon this society for accomplishment, and as I look about me and behold these old tried veterans of pomology, who have borne the heat and burden of the day, and whose heads are already blossoming with the frosts of many winters, this question naturally arises, Who shall take up the work where they shall lay it down? Who will bear the burden when they shall have passed away? Will the generations which are to follow us commence where we commenced forty years ago, and struggle on through life, endeavoring to reach a successful issue in this horticultural work, and when they have gained the point where we now stand, will they surrender just on this ground?

I see those before me to-day who have the promise of outliving the present century; who are full of life, full of hope, vigor, ambition, and perseverance; those who have ability, whom I believe will hold up and hold on; who will bear up and bear on, who will strive to emulate the useful and sacred principles and practices inculcated by this society. To these my words have been addressed, and if my experience will aid them they are welcome to it.

Over in Washtenaw we have a county society that is a branch of the State Horticultural society. We get together monthly and compare notes, gather information and store away new ideas. We believe it pays, and I counsel you here to go and do likewise.

Upon this subject of buildings we are yet at work, and hope to improve our structures and methods as we acquire experience.

Porter Beal, Geneva: How much will such a house as you describe hold?

Mr. Dorr: It has a capacity of about 5,000 bushels.

Mr. Beal: At what expense was yours erected?

Mr. Dorr: About six hundred dollars.

S. B. Mann, Adrian: Have you any secret in its construction or any patents on your method?

Mr. Dorr: No; I apprehend the method of preserving fruit by uniform low temperature is too old to be patented, and what I have learned is free for others. A great many people have visited my building and I shall be glad to give you all the "freedom of the house."

Secretary Garfield: How does your fruit stand up when exposed to the air on the market?

Mr. Dorr: I can only answer by saying that last May my fruit sold over fifty per cent better to the dealers in Chicago than refrigerator fruit, simply because it would resist decay longer.

B. W. Steere: How much waste is there in the fruit you store, by rotting or specking?

Mr. Dorr: This depends entirely on the variety. In 1,500 bushels of Baldwins there was not a hat full wasted in a barrel, while of Black Gilliflowers nearly a fifth was unmarketable.

Secretary Garfield: How about the Spy?

Mr. Dorr: That variety does not keep well in my house; the same is true of the Rhode Island Greening; both of these varieties should be shipped in February, and then the percentage of loss will be very much less. If apples are kept until May, there will be with most varieties a considerable loss; I do not pretend the house will keep fruit perfectly.

Mr. Carson: When would you advise picking fruit for your building?

Mr. Dorr: When the seeds turn brown.

President Lyon: Certainly when apples begin to fall they should be gathered. How much sooner is a question of importance.

The general subject was continued in a short paper by Mr. S. B. Mann of Adrian, on

MODERN IMPROVEMENTS IN HORTICULTURAL IMPLEMENTS.

The primitive condition of the soil in early ages required, no doubt, far less labor and tillage to produce a crop than we find necessary to-day, especially in this climate. Ever since the edict went forth that "man should earn his bread by the sweat of his brow," there has continued a struggle between stern necessity and human intellect for supremacy; the effort being by the latter to render as near as possible inoperative the divine command—to prove it possible to reduce said sweating process to a very low ebb.

Whether this has been the one grand object of modern invention and improvement, is hard to say, but we may safely conclude it was from their universal claim of being "labor saving" in their character. But whatever may have been the object the result has seen not so much to save labor as to render that labor more effective and complete.

The earliest known horticultural implements were the "pruning hooks," spoken of in holy writ, showing that there was a belief that pruning was a benefit if not a necessity. As intelligence developed it was found that tillage and culture were a benefit, that as time passed and wants multiplied, became absolute necessities for the maintenance of human life and progress, man, with only his hands, soon found he must have other helps, and differing from the rest of the animal kingdom, which were as perfect in the art of constructing their habitations at the early dawn of creation as to-day, soon brought into use his God-given power of thought, that formed for his use and help implements, though wonderfully crude at first. The increasing humanity demanded an increasing supply of what Mother Earth could give, and this demand has gone on and on, and is still as urgent as ever, and bids fair to be while time shall last.

The stern maternal parent of invention—necessity—still asserts her authority, and is as unyielding in her demands as though no progress had been made.

Professional horticulture was not known a few years ago in our country. To-day it has come to be one of the prominent factors of internal and external commerce. The slow process of hand labor, the simple hoe and deft fingers, with the prostrate form of the gardener in the noon-day sun would fall far behind in the race of supplying the demand of to-day for the vegetable market of the world. There has appeared the horse-hoe and the hand wheel-hoe, the pulverizer, the harrow, the roller, and marker, the seed-drills for hand and horse power, rendering the labor of one man equal to a score by the older methods. The minutest seeds are now sown with perfect accuracy, while the next row is marked. The most delicate plants are protected while the miniature plow, cultivator, or harrow is passed swiftly over the ground, lightening up and stirring the soil and destroying the ever present weeds.

What is true of the vegetable garden is equally true of the orchard and fruit garden. The pestilent insect has not only to confront his old enemy, the birds, but patented machinery and chemical compounds for his destruction. Fruit ladders, fruit pickers, patented fruit packages both honest and "snide," are now a commercial commodity and complete in themselves, ready to the hand of the horticulturist. To give a description of these would be an endless as well as a needless task. The people of to-day travel and read. The agricultural press is replete with cuts and descriptions, while at the fairs are to be found actual machines for inspection, with the eloquent and affable vender to instruct and explain. Should we turn back our thoughts, then, and note carefully the changes and improvements of the last fifty years, we are led to exclaim, "Wonderful indeed is the power of human intellect." Would it be as allowable to send forth our thoughts in the other direction and allow our imaginations to picture the improvements yet to be wrought?

From the slow-plodding and patient ox of a hundred years ago, hitched by a rude stick on his horns to a ruder one for a plow, disturbing the native soil, we have come to behold the beautiful steel implement, polished like a mirror, moved with rapid strides and undeviating accuracy over the fields by the steam engine. Though not a prophet, nor the son of a prophet, yet may we not be allowed to predict that the next fifty years will show far greater improvements?

To-day steam has become too slow to meet the demands of impatient man, and the lightning has demurely yielded to the command of his quicker intellect, and now as meekly and unerringly carries our messages as did the postman of olden times, not allowed as of old, when it rent the heavens around

Mount Sinai, to simply flash its lurid glare athwart the sky, but is commanded to stand still, like Joshua's sun, to light up our cities and towns.

Can we not as well attach its mighty power to our railroad cars, to our road wagons, aye, and our plow as well? Shall not some Edison yet live who shall be able to throw a miniature storm of electricity over a tree or plant, that shall kill at one shock a million of worms or insects? Can it not be made useful to warm up the cold earth in early spring, to hasten forward the slow growth of plants and vegetables for the early market?

Though we may well feel proud of the improvements of to-day, and congratulate ourselves that we live in this grand age of advancement, yet what we glory in may humiliate posterity, as it contemplates our weakness.

Mr. Gibson of Clinton, exhibited his whiffletree for orchard use, which had pulleys on the ends with rubber tire to act as fenders to prevent the barking of the tree.

Mr. E. M. Potter of Kalamazoo, was called out, and responded with a talk on

IMPLEMENTS.

I noticed in the Michigan Farmer of last August a copied report of the proceedings of the "Bedford Farmers' Club," in which every member whose sayings were included in the report denounced machinery, except a Mr. Davenport, and we would really think that the others not only lived in Bedford, but had lain in bed most of the time. The report to which I have alluded related more especially to the use of mowers, horse rakes, harvesters, and threshing-machines, and the two most fallacious arguments produced were, that these machines "made boys lazy," and that "grain could be threshed cheaper with a flail." Well! a flail is a machine, as well as a fanning mill, therefore, according to this wholesale denunciation a man better rub his wheat out with his hands and blow the chaff out with his mouth. He might get a grist out in time for the next centennial, and carry it to mill on his back. But a grist-mill is a machine, therefore he better lug it back and cook it without grinding.

Well, I am glad there is no one here who is so anxious to have the "greater light" go back on the dial of his life as to entertain any such foolish nonsense. If there is any one thing that the tiller of the soil ought to be thankful for, in addition to his constant obligations to his ever-bountiful Creator, it is the genius and skill which now enables him to accomplish much more than formerly, and do it ten-fold better. But it does not follow that every implement or machine which is produced is the best that can be made for the work which it was designed to accomplish. Nevertheless we are under great obligations to every inventor or artisan who turns his attention to the production of these facilities, for the most imperfect machine may be the means of suggesting something better. He who can see no defects will seek no improvement, and this assertion will apply to all the efforts of this short life. Therefore it is well for inventors and manufacturers to invite criticism, for the very best theory is that which results in the best practice. It is an old rule of philosophy that what a machine gains in time is lost in power, consequently the power must be increased. And yet while this general proposition may hold good in some cases, we think that much depends upon how the power is applied in order to overcome the resistance or to accomplish the desired object. While an implement, to all appearances, may be well adapted for a specific work, it is hardly safe to rely on one's first impressions without making a test or conferring with some reliable party who has tried it and is fully capable of adjusting its parts and judging of its merits.

It also often happens that a machine will do good work while new, but after a little wear will fail to sustain a good reputation, and we think from our experience and observation that the more complex a machine is the more liable it is to get out of order. When one contemplates the purchase of an implement he should ask himself the following questions: Will this implement or machine do the work better, quicker, and with less cost than can be done in any other way? And in counting the cost one should take into consideration the first expense and the interest on the investment while it will remain in good working order, and the necessary power to be applied. And in estimating the durability we should resolve to care well for the implement or not purchase at all. And I may say here that a sheltered place for tools and machines should be one of the first investments of any horticulturist. It will not pay any man to purchase implements of any kind unless he will use them properly and take good care of them. There should be an assigned place for each one under a good roof, and when not in use they should be there and no where else. It will not do to "put de rake wid de hoe, and de hoe wid de rake," and leave them both out in the garden to rust. No man can do a good day's work with a rusty hoe or spade. Even a wagon will last three times as long, doing the same work, if sheltered from drying winds, sun, and wet, than it would if always left exposed, besides the annoyance of breaking down in some unexpected moment when one is in a hurry.

It is always well to look over implements before the season arrives when they will be needed, and see that they are in order before they are wanted for use. I used to know a man who had a habit of taking bolts out of his wagon in winter to fix his sleigh, and in summer he robbed his sleigh to repair his wagon; and in his barnyard and lane was a motley collection of these old relics of his make-shift policy. As a rule implements or machines that are designed for several kinds of work, fail to accomplish either as well as those intended for a specific purpose and for that only; and yet I am aware that there may possibly be some rare exceptions. We find it even so in utilizing hand labor. I remember when but a small boy, that one day a raw Irishman, fresh from the "old bog," came along and applied for work. He was asked "What can you do?" Pat's reply was, "I can plow and I can sow; I can reap and I can mow; I can skim the pot, and lick the paddle; bedad! I can do iverything." He was considered most too smart, and got a free pass to the next house. I would not in the least deprecate the Yankee style of general adaptation, or the ingenuity which would lighten our labor or enable us to do more and do it better, in this short life, than we could without these praise-worthy efforts. We are glad that while brain may go faster than muscle, that genius is ever reaching out a helping hand to the weary laborer on his journey through life, and he who fails to appreciate her laudible exertions deserves a place so far in the back-ground of human existence as never to be seen or even heard.

President Lyon: I have not heard the oldest horticultural implements alluded to, yet I can hardly believe we have outgrown their use entirely. I refer to the fingers.

C. B. Stowell, Hudson: As far as their use in sowing seeds is concerned, to men who sow onions by the acre they are sadly behind the times.

Porter Beal: Mr. Mann's electricity idea throws the thumb and finger too far in the shade to be noticed at all.

Secretary Garfield: I would like to inquire of Mr. Scott what cultivator he likes best for shallow culture?

E. H. Scott, Ann Arbor: I have always used the ordinary five-tooth cultivator, but I am favorably impressed with the spring toothed implement and am going to try one.

Mr. Potter: The spring-tooth harrow I like very much as used with a team in the field, but as a single cultivator my experience has not been favorable to it.

J. S. Woodward, Lockport: I like the ordinary five-tooth cultivator, but the teeth should be kept sharp. Every cultivator should have a double set of teeth, so that when one set gets dulled another sharp set can take their place. I believe in flat culture everywhere, and these implements are suited to it.

Mr. Dorr: I like the spring-tooth cultivator for small fruits, but we must not expect too much of this implement; it will not mow a yard or pull stumps, but when used for what it was intended it does the best of work.

Mr. Scott: I have a circular cutter that I attach to a small plow which cuts off the runners nicely in strawberry beds. I turn the furrows away from the rows, then put in my cultivator, producing flat culture.

FRUIT PACKAGES

was the next topic announced, upon which Mr. A. D. Healy of South Haven remarked, by way of opening:

This subject interests us on the lake shore, where we have all kinds and sizes. My view is, let a quart package hold a full quart; let a peck hold eight full quarts; don't try to cheat, but be honest and in the end it will pay handsomely. Above all things do not go to your cooper and order him to make your barrels one inch shorter or with an inch less bilge. Whatever the producer gains, or seems to gain, is taken illegitimately out of the consumer. Every packer of fruit should use a package upon which he is not afraid to put his name and address. A short package is not a good advertisement. There is a heap of dishonesty in packages sent out of western Michigan. Some factories which make peach baskets, I understand, have no forms upon which to make full sizes because there is so slight a demand for them. I wish to enter my severest protest against such frauds.

Clean packages, with fine netting placed over the fruit to make it attractive, sell the best in the market.

Professor Beal: Firmness is a good quality in a package for soft fruit. I I have noticed a great many grapes shipped in ordinary market baskets. The fruit soon becomes bruised and injured. A stiff bottom would much improve the package.

Mr. Healy: I like the round, stiff packages best for grapes.

W. W. Tracy, Detroit: In our market the handle baskets are liked best. I suppose habit and fashion have a good deal to do with this.

Mr. Potter: I like the handle boxes well for grapes, and they are used a good deal with us.

Mr. Tracy: The point made by Mr. Healy as to color of netting is a good one. By giving attention to complimentary colors fruit may be given a more attractive appearance. To illustrate, a florist in Detroit placed a white begonia upon a bracket in a church which was finished in a bluish tint; the begonia appeared to be an orange color, and I took it to be such until disabused of the notion by the owner of the plant. Now, by using about the fruit package a tint that is complimentary to the tint of the fruit the color is heightened and the basket of fruit rendered more attractive.

Mr. Healy: I have a practical illustration of this. My business in fruit shipping season takes me into Chicago often. One day on South Water street I noticed a fine lot of peaches in very ordinary packages offered at $1.40, while my peaches, no better, were bringing $1.75. I bought the fruit at $1.40 and placed it in my packages and sold it at $1.75.

Upon request, Mr. Tracy described a cheap hand seed sower, after which the meeting took a recess until evening.

Evening Session.

Excellent music was furnished to open the exercises of the evening, after which the following committees were announced:

On Credentials—Messrs. Whitbeck, Stowell, and Phelps, of Hudson.

On Fruits—Wm. Rowe, Grand Rapids; J. S. Woodward, Lockport, N. Y.; Mr. Gibson, Clinton.

On Resolutions—E. H. Scott, Ann Arbor; S. B. Mann, Adrian; H. D. Cutting, Clinton.

The general topic of the evening was "Primary Horticulture," upon which Prof. W. W. Tracy gave the first address upon

SEEDS,

What are they, how made, and what are they good for? The address was admirably illustrated by drawings upon large sheets of muslin. The following is an abstract only of his remarks:

Seeds, how are they made, and what are they made for, are questions which will be asked by thousands of children, and possibly by some grown people, before many weeks, and so I ask your attention to the consideration of them this evening. In doing so I shall try to avoid all botanical or scientific names and methods of inquiry and look at these questions more in the way a bright, intelligent boy would do were his interest excited by seeing the seeds he had planted springing up into promising plants. This will necessitate the ignoring of some nice botanical distinctions of great interest to the botanist, but which would simply cloud and dim the subject were I to introduce them here; but I shall try to avoid any statements which would in any way mislead or give a false impression of the real structure or mode of growth of the plants of which I speak.

Let us look at the last question first, and through it find an answer to the first. No one who has any appreciation of the beauties of nature (and who has not) can fail to see that one great element of that beauty is the wonderful commingling of different species; but still few people realize how wonderfully they are mingled. A few statements may aid us in this. The number of clearly marked and distinct species is variously estimated at from 75,000 to 150,000. Some of these species number millions upon millions of individuals, and are found all over the known world. For instance, I have seen the common silver weed (*Potentilla anserina*) growing beside the curb stones in Detroit under the shadow of the City Hall; in New York on the ocean shore; at Marble Head, five miles from any human habitation; on the Upper Peninsula, and on the banks of the Mississippi in Wisconsin; and botanists tell us it is to be found abundantly everywhere in North America from Pennsylvania to Greenland, and from Oregon to Behring's Strait; all over Europe from the Mediterranean to the Baltic, and in Asia everywhere north of the Altai range of mountains. Flint states that in England 30 distinct species of grasses were found in a single foot of what was considered average old turf. I think it would be difficult to find a single rod of ground at all covered with vegetation which did not support a score or more of species. Few people, too, realize how greatly the beauty of every landscape depends upon this mingling of species. It has been remarked by one of the best art critics that in no way does the genius of the great masters in landscape painting show itself more clearly than in the working into their pictures of the infinite variety of vegetable forms which always exists in nature. Let any one attempt to make a landscape for himself, either in the field or on canvas, and he will find that it gains in power, spirit, and beauty just in proportion as it truly represents the thousands of forms which in nature always meet the eye.

But is this mingling of forms of any farther use than that of beauty? The answer comes quickly, O, yes! It makes our world far more enjoyable, and it even makes men better! For dear as are corn and beans to the New England heart, it may be questioned whether they have exerted a greater influence in shaping New England character than have the birch, the beech, or hickory which grew so conveniently near the school house door. Who can tell what that character would have been if all those persuaders had had to be imported? Is it not possible that the train robbery and murder of Kansas and Missouri might have been saved if their fertile prairies, besides their wealth of grass and wheat and corn had grown some such plants conveniently near her homes and school houses?

But how was this mixture brought about? Plants are of all living organisms the most stationary; and granting that they were originally created and established in this mixed condition, how could they maintain it through the constant changes wrought by frost, fire, flood, and tempest? How do we do when we want variety in our grounds? We transplant. How do we do this? We first wait until the leaves are fully ripened and fallen and the plant is in a dormant condition. Why? Because the leaves, although essential to the health and growth of the plant when in an active and growing condition, keep up an incessant demand for food and water, and if the roots cannot supply these, as they could not while in transit to and before becoming established in their new home, the leaves would soon drain the rest of the plant of its food and so starve it and then perish themselves. But if we wait until the leaves have completed their work we shall find at the base of each ripened leaf a tiny bud; and in this, snugly tucked up in covering scales, are sleeping tiny new leaves, which do not now demand much food or water, but which are ready when these are supplied to spring into life and growth and reclothe the plant with newer and fresher leaves.

2d. We carefully dig up and secure attached to the plant in an uninjured condition as many roots as possible. Why? Because they are practically the only means the plant has of securing nourishment, and we must provide it with the means of collecting this in its new home.

3d. We cut off a greater portion of the top. Why? Because, do the best we can, we can only secure a small portion of the roots, and these in an injured condition, and they are certain of being still farther injured in the journey, so that it will take them some time to become established and get to work in their new home; and then in weakened numbers and condition can only nourish and push into active growth a very few of the many buds originally on the plant. Gardeners all understand this and cut off the tops of their plants so as to leave the number proportionate to the strength of root, frequently cutting back imported plants to a single bud.

4th. We pack our roots so as to protect them from the air and keep them moist. Why? Because those organs designed to live in the cool, moist earth are not fitted to withstand the constant changes which occur in the atmosphere, and if exposed to them would soon be killed.

5th. We wrap our plant in some soft material which will hold the root packing in place and still further protect it by some heavier, stronger covering while we carry or send it to the place where it is to grow.

We then secure variety by transplanting, in which it is only necessary to transport one of the little buds to a new home and provide for its nourishment and growth, which we can only do by keeping with it some of the roots of the plants, but these roots are the great obstacle to transplanting, as they are secured with difficulty and must be carefully protected while in transit. Returning to our question, how is variety secured in nature, and the answer comes, by seeds. But what are seeds? Let us see.

Seeds, then, are simply plants packed with the omnipotent wisdom and skill of the Divine hand for transportation. What is the practical bearing of this fact? Simply this, that when a farmer goes into his field with his seed corn or wheat he carries with him the future possibilities and limitations of his crop as completely as when he takes out a load of trees to set in his orchard ; indeed, more so, for it is not practical to change the character of his corn and wheat plants by grafting or budding, as he can do in the case of his trees. His seeds planted, the character of his crop is determined. He may secure a more or less perfect development of the fruit, just as he can by cultivation grow fine, fair fruit or miserable, scabby ones from his Baldwin apple tree. But he can no more change its character than he can grow Greenings on Baldwin wood, or make, by extra care and feed a Short-horn bull out of the new-born Jersey heifer calf. If these facts are true, and I honestly believe I have stated them fairly, can we pay too much attention to the matter of the selection of our seed-grains, and do not the farmers of Michigan owe Professor Beal a debt of gratitude for the constant and earnest persistency with which he has urged them to do this, and the practical methods in doing this which he has so frequently and clearly described.

The above gives but a feeble idea of the character of the address as given by Professor Tracy, with pointer in hand and charts of illustration before him.

After a duet by Messrs. Smart and Brown, the audience listened to a short paper by Mr. E. M. Potter of Kalamazoo, who, pursuing the same general subject, took from the scheme the topic

MICHIGAN NURSERY STOCK.

To conduct successfully this department of horticulture in Michigan requires years of practice and observation in Michigan, and this assertion, we think, will apply to the business in almost any climate or locality. Those who have attempted to follow out the well-defined theory and practice of others, who were considered fully competent to impart the desired information, have too often been rewarded with great disappointment and pecuniary loss, and for the very reason that the advice and practice of possibly successful experience under entirely different conditions was taken as a guide. We think Michigan has produced nursery stock which in range of quality would compare well with that of any other State. What we mean is, some stock just as good, and undoubtedly some just as poor. But that it is not possible to grow as good stock in Michigan with the same degree of certainty as elsewhere, we are not prepared to admit. On the contrary we think, with proper management and a judicious selection of soil and location, just as good stock can be produced here as can be found anywhere, although in the case of some kinds a greater expense, perhaps. We are inclined to the opinion that some trees get more fibrous roots in Michigan if properly grown, than in other localities where there is less sand in the soil. We also believe that while perhaps a faster growth may be obtained in some other localities, it is here compensated by a greater degree of hardiness. We repeat that we think, undoubtedly, some kinds of nursery stock can be well grown with less cost in some localities than in others, and we think we can already discover a growing tendency with nurserymen to pay their chief attention to some specialty for which their location is peculiarly well adapted; and a greater inclination among planters to procure what they need directly from the producer. Not that we think the canvasser is destined to oblivion, by any means. No! No! for we shall always consider a real wide-awake, and competent canvasser, who is strictly honest with his customer and true to his employer, as a desirable attaché to the business, and one of the noblest and rarest productions of the craft. Such an one, like the standard dollar, ought to be well received everywhere, but I am sorry to say that too often the glittering counterfeit is taken at a premium, while the genuine gets both "clipped and punched," if not wholly rejected.

Without taking your time for a detailed comparison of our productions with those of other localities, I will say that in my opinion a great deal more depends upon the proper treatment of nursery stock after it is well grown, than upon the locality which produced it. Yes, very much more than most planters are aware of, and I presume to say that more well-grown stock is actually lost from bad treatment before planting than all other causes combined, although the result of this ill treatment may not be always manifest to the inexperienced until after it has been assigned its place in the orchard.

Very much is lost from bad packing, not always the result of ignorance, but often sheer carelessness. Trees, vines, and plants may be packed so as to go safely across the continent, and they may be ruined during a short journey, by neglecting proper ventilation or some other requisite for a safe transit. But a still larger proportion are ruined between the time of unpacking and planting. We have known instances of purchasers who received well-grown trees in good condition, put them in a wagon with no protection to the roots, wait around town two or three hours, then drive home several miles, arriving late in the evening, who would care well for their team, and "heel" themselves into the house quick as possible, but leave their bundle of trees out over night with roots exposed to drying winds or frost, and if convenient plant them out next day or the day after, and afterwards decline to pay for them or ask to have them replaced because they did not grow. How often have I heard just this class of horticulturists, if I may call them such, say that "trees will not grow for me and I will not try any more." Probably the very best way for the planter to supply his wants, especially if he is located within reach of a reliable nursery, is to go directly there and procure his trees, then see well to it that the roots are not allowed to dry during the journey or process of planting, and not fail to mulch directly after the planting is done. The roots of evergreens during transplanting should never be allowed to dry, and if packed in boxes the foliage should be kept dry and well ventilated.

Undoubtedly some nurserymen have injured their reputation for well-grown stock by selling at a discount that which they might have more wisely destroyed, or by undertaking to do more than they could well accomplish with means at their command; and probably this failure to fully "count the cost" is the cause of very much disappointment in many other business enterprises.

The question with the nurseryman should be, not how many trees can I crowd into that plat of ground and grow them in a hap-hazard sort of way, and so undersell all my competitors? but how can I grow the best stock, and that which, when it comes to bear will be the best for my customers? The question with the planter should not be, where can I obtain the cheapest trees, and on the longest possible time? but where can I get the best and most reliable trees for cash? for you may rest assured that no nurseryman can conduct a successful business whose capital stock is watered every spring and fall with slow notes. It should be a rule with every man to "patronize home institutions," especially if he can get just as good goods for the same money as elsewhere; and if our planters would persist in doing this, thousands of dollars which now go out of the State for trees would be used in the development of the nursery business in Michigan, which in the not very far distant future might compare well with that of of any other locality.

B. W. Steere gave some instances where planters of trees often used no care when trees were taken out of the ground before they are put in again, and when they died often blamed the nurseryman.

Professor Beal: Any man who reads the reports of the discussions in our society as written out in our annual volumes will not abuse his nursery stock in transplanting.

Mr. Lyon: It is of great importance in selecting nursery stock to get that which has been thoroughly ripened. Oftentimes stock is entirely ruined for transplanting by reason of late rapid growth in the fall.

Secretary Garfield: I believe in Michigan planters as far as practicable buying Michigan nursery stock; and upon this theory, that if a tree is to be transplanted the shorter the distance of removal and the greater the care in its transportation, the less chance the tree will take. I do not say this to push up or pull down any nurseryman. If I lived in Ohio I should say buy Ohio stock; if in New York, buy New York stock. Buy always of the nearest reputable nurseryman who has what you want, even if you have to pay a little more for it. I say this, too, knowing that some ignoramuses buy stock at a near nursery, throw it into a lumber wagon, drive home in a bright sun or a dry wind, and lose all their trees, and curse the nurseryman; and buy thereafter of some foreigner who knows how to pack trees, and as a result succeed better. But as Professor Beal says, when I advise men I also tell them where they can get the desired information that will lead them to avoid the blunders of ignorance, by referring them to the discussions in our volumes.

Porter Beal: Can Michigan nursery stock be grown of as much hardiness as that imported from States a little south of us?

Mr. Mann: I have yet to find any proof to the contrary. I believe stock grown here is just as hardy, of the same varieties, as can be grown anywhere.

Mr. Steere: I don't see why this should not be the case, because in our native forests in Michigan we have the greatest variety of trees of any State I know, and the different sorts succeed well. If this is true of native trees, why should it not be true of the average stock in nursery rows in the same climate?

Mr. Montgomery: I think too many nurserymen, in order to get nice, straight trees, force the growth too rapidly and thus weaken the vitality of the stock.

Mr. Taylor: I want to buy my stock of a man I can reach if it does not prove to be what he recommends. I see no harm in forcing trees if afterward the wood is thoroughly ripened.

Professor Beal of the Agricultural college carried on the subject of primary horticulture by reading the following unique paper on

THE CHILDREN'S GARDEN.

A TRUE NARRATIVE.

There is only one child in my family, but several of my neighbors have children. My good wife generally supplies them with cookies, maple sugar in generous chunks, and other things which will surely draw the youngsters to our door. In one sense all the neighbor's children are ours; our dooryard and garden are their headquarters. One or more of them generally unites with our little girl in making garden. Every child likes to play in the dirt; they take to it as naturally as young ducks to the pond. In the spring of the year, if at no other time, every one is in a fever to "make garden." The children imitate the older people.

In 1877, when my child was seven years old, she took in a neighbor's girl, aged five and a half, as partner, and they made a vegetable garden. The space selected was not very large—six feet square. They made their own plans, and sowed a few seeds which were given them. For a while all things went lovely, but on the approach of hot weather the ground became hard and the weeds numerous; hoeing in the hot sun was not so funny as planting in the mellow earth in May. The girls were sometimes urged to hoe their garden; they were sometimes helped a little. The garden looked like too many larger gardens I have seen. The crops were light and easily harvested; the profits were small. The rows were not straight nor were the distances between them always well proportioned. Some things had room to spare, others were crowded. Still, the garden was not a failure. It afforded some occupation for the long days, and gave the children a little experience. They studied the gardens of older people the more carefully.

Towards spring of the next year the same children, Jessie and Anna, one eight, the other six and a half, took much delight in ransacking several illustrated seed catalogues. A few seeds were again given them. They asked for help in making plans and some help was given. This year the garden had expanded to about a square rod. They put in a miscellaneous lot of seeds for vegetables, which they peddled among the neighbors. One of the most profitable plants was a hill of field pumpkins, the fruit of which was sold to the boys at four cents a piece for making "Jack o' lanterns." In the garden, among the green or golden fruit, one of the boys had, without charge, placed a rude sign "Pumpkins for sale." It drew everybody. The money for the sales was divided between the little gardeners.

During the next season a better vegetable garden was maintained, and an indifferent flower garden. The location of the latter was not good. My girl, Jessie, showed the usual shrewdness in business matters which runs in the family. She did most of the hard work and made her partner the treasurer of the firm.

In the spring of 1880 Jessie had a little help from Clara, another girl about six months younger. They were then nearly ten and nine and a half respectively. Listen while I report what one of them says as she turns over the seed catalogue and makes her plans on paper. The plans showed the position of all the vegetables in the garden which was yet to be. They received a little help, but their enthusiasm needed no stimulating. The subject was frequently reviewed, apparently with great delight.

"I think Ferry is a good man to send me—a little girl—such a pretty catalogue. I want to tell you what I am going to send for, some of Dreer's improved Lima beans. See how close they are in the pod! They do not waste a bit of room. I want some improved early turnip beets for greens and the bottoms for cooking. No cabbages for me. The worms trouble me so. Professor Johnson last year had some great, nice heads which Clara cut off. Mamma says 'carrots won't pay.' They don't sell well; nobody wants any. Cauliflower and celery are too much bother. I shall have to raise lots of corn to make it pay. A little does not amount to anything. Early Minnesota is pretty good for early, and Stowell's evergreen for late."

"I am not going to raise any cucumbers because I do not want to hoe them. The vines spread out and always get in the way. We raised one hill last year and nobody bought any. I want lettuce very early. We can sow Tennis ball before the ground is warm. It will be an early crop. Ferry's early prize head is a good kind, because it heads up nicely, so you don't have to pick it over much. The dirt can't get in any more than into a head of cabbage."

"I am going to try Martynias. They bear lots of splendid little pickles if pickled when young. Cucumbers do not bear so lavishly, and besides, everybody has cucumbers."

"Last year we raised one melon vine and the melons did not ripen well. I never have any luck with melons. They do not amount to anything, and we eat them and get no money. Money is what we are after."

"Yellow Globe Danvers is a good kind of onion. I will have one row. I want a little parsley. That is beautiful for bouquets and for garnishing. What is garnishing? Oh, it is for trimming up dishes of meat and things."

"I shall raise more peas next year. Ferry's First and Best, an early sort. Shall we have some late sorts? Yes; I guess so. The Champion, of England, is good. They need poles. We cannot hoe between them without poles. The moles took your peas last year and year before. Why try again to raise peas? If they bother me I will hoe the peas all down and not raise any."

"I want some long red Cayenne peppers to strengthen up pickles. Everybody wants a few peppers to go in with pickles. They are sharp, awful sharp, if you only just touch the tip of your tongue to one. Large Bell or Bull Nose are the best for pickles themselves, because they are not so sharp. We can sell them, because lots of folks wanted them last year. I do not know whether to raise potatoes or not." Some one says: "You said they paid you last year the best of anything you raised." "I guess so. Put in a dash there about potatoes. I have not decided to night."

"Radishes, early, long, scarlet, short top is a good kind,—improved it is early, scarlet, white tip. They are handsome, with a little white tip on the end. That is all about radishes.

"Spinach, for greens; that is, early, thick-leaved, summer."

"I do not want any vegetable oysters. I had no luck with them last year.

I do not know of anybody who likes them to eat. As easily raised as parsnips, are they? Well, I don't want any."

"Squashes? I don't want any. There is too much fuss of a big vine for a little squash. We raised some crooknecks last year. The vine ran all over our potatoes. We sold five squashes at two cents apiece. We will raise some tomatoes. The soil over to Clara's house is just the thing to raise them in, because it is poor. The catalogue says, 'the soil should be light and rich.' At Clara's house they had tomatoes last year two weeks earlier than anywhere else. I could have sold some last year. Mrs. K. wanted some. Ferry's improved early, large, smooth red is one of the best. Trophy is too late for us. I guess I will have some Trophy to use late for canning, when the others are gone. No turnips; no sweet herbs. That ends the list."

The former experience of the children has made them more or less familiar with most of the common flowers and vegetables. They have learned that it is the best way and the easiest way to hoe and rake a garden often, and never let weeds get much above the ground. They see the beauty of straight rows and the convenience; they see an advantage in order and system. This beauty and order tends to make them neat and particular, and these tend to increase their interest in the garden, and an increased interest causes them to keep a better garden, and a better garden produces more and better flowers or vegetables in proportion to the work expended. From early spring till autumn everything, during 1880, was clean and well kept. The sales, although not large, encouraged the little gardeners. Previous experience in managing the money was of some value, and not soon to be forgotten. Some of the money this year was used to buy fireworks for the Fourth of July. After the display was all over and the excitement was gone there came a reaction. One of the girls cried hard to think she had thus burned up so much money, for which she had worked so hard during the year. She would never do so again. Thus they learned to use money judiciously.

In going from house to house one day they called on a lady who had not been long in the neighborhood, and who did not understand the plans of the little girls. They had lettuce to sell that morning. Would she like some? "Oh, yes; it is nice; I am very fond of lettuce. Tell your mother I am very much obliged to her." The girls were surprised, but one of them said, "you are welcome." She was too polite to say, at that time, that she brought the lettuce to sell. In relating their experience one of them told her mother that it was a good joke on the lady. It was not difficult to show her that the joke was on the girls. It is now over a year and a half, but to this day the lady is ignorant of the unintended joke played on the little gardeners.

In 1881 an improved site for a flower garden was chosen. The seeds were selected and purchased long before it was time to plant them. The design was original with one of the girls, and was not made without some anxiety. The plan is here presented, just as made by one of the girls. Much advice was sought as to the merits of different plants. I showed my interest in their garden by enriching and deeply trenching the whole of it.

Now, in the spring of 1882, the girls are about twelve years old. Their interest in gardening was never so great as at the present time. My library is accessible. All the books on horticulture have been examined, and some of them have been read in part over and over again. Such books give them as much pleasure as Mrs. Alcott's Little Women, or Mrs. Stowe's Uncle Tom's Cabin. Some of the favorite books are Henderson's Gardening for Pleasure, Barnard's Gardening for Money, The Children's Garden and What They Made of It, by Agnes and Maria E. Cotlow of London. E. H. Leland's Farm Homes is as good as a novel, and will do one good, although the girls criticise some parts of it quite severely. The Rural New Yorker, and the Ladies' Floral Cabinet are read as they come to the table.

One of the girls thinks she is now fully competent to manage a flower garden and a vegetable garden. They shall have a good chance, and God speed them in their undertaking. There are many debates about some of the flowers. Petunias stand dry, hot weather first rate, and make a good show, but they are sticky to handle; they sprawl all over and are not sweet to the smell. They are discarded after one year's trial. Pinks are rather straggling. Pansies do not stand dry weather. Asters are good if started in boxes, and well transplanted. Sweet Alyssum is about right. Portulaca are nice. Balsams are lovely. Mignonette is nice for bouquets. Phlox Drummondii is very handsome.

They are encouraged to try a few new things each year. This gives them more experience and thus they become acquainted with more kinds of plants. They saved seeds of some sorts last year. Here they learn economy and forethought.

This society has taken a deep interest in the improvement of school grounds, and some of the members have advocated the introduction of agriculture or horticulture into the common schools. Capital Grange, in Lansing, not long ago, discussed this topic. Some advocated that every school house should be near a piece of ground which should be used for instruction in gardening. Here all the children should work and be shown how to perform various gardening operations in the best manner.

Much of the labor on our farms, especially that pertaining to the garden, and orchard, and vineyard is imperfectly performed. What vast sums of money could be saved if all, or even if a considerable part were well trained in the rudiments of horticulture. How much greater would be the satisfaction to every one who undertook any kind of work in horticulture. How much stronger would be the attachment for rural life. A person likes to do what he can succeed in. A bungler is seldom satisfied with his business.

A Yankee thinks he can turn a hand at anything and prosper. Many meet with considerable success in this country where wages are high. We are living at a time when few think of serving as apprentices to learn a trade. Our country is full of incompetent workmen. I mean they are very common who have taken hold of trades, or some part of agriculture with scarcely any preparation. We need to do something to arouse an interest in technical schools. The subject is already attracting a good deal of attention in many places. If well trained a person is a more capable workman; he is more likely to be successful, and therefore more contented and happy. I put great stress on mechanical ingenuity. I have had a good deal of experience with men and boys in most that pertains to horticulture. No one thing will make them more likely to succeed than skill in the use of tools and in keeping them in good order. No man, certainly, is competent to act as foreman who is not well skilled in this particular. My experience in teaching has fully convinced me that nothing is easier to teach than gardening, and that children can be very easily interested in such work. They must practice what they are taught in order to keep up the interest and become familiar with all the difficulties. Much as we should teach children at home or in the school, so we should teach older people how to become expert in any department of horticulture. My former reports are well filled with my notions of teaching horticulture. It cannot be done merely by a course of lectures. As well might you teach a man how to become a blacksmith or a shoemaker without taking the tools in hand. The manipulation of tools—doing the thing itself—must be insisted on.

My plan with students of the Agricultural College is to take them out in groups of six or eight, with tools in hand. I show them, and watch while they work. A record of the success of each is kept in the same manner as we keep a record for class-room work. This out-door teaching is the hardest kind of teaching. It is hard to talk to a company in the open air and keep their attention. Of course I teach students more about horticulture than merely the art of doing some things well.

Following Prof. Beal's paper the Secretary called attention to the work of the Society, the character of its reports and the standing it had acquired through the efforts of a few individuals, and asked that the people of Lenawee coöperate with the Society, and share in its burdens and success.

Mr. Woodward, of Lockport, gave a glowing account of the work of the Society as viewed by an outsider, saying there should be ten thousand members in Michigan who would gladly pay the dollar membership in order to maintain the character of the work done by a few self-sacrificing horticulturists.

Adjourned until morning.

Wednesday Morning Session.

At half-past nine o'clock the institute was called to order by the President, and after a word of prayer by Rev. Mr. Patterson, Mr. E. D. Peirson read the following paper upon

THE ORCHARD AS AN ADJUNCT OF THE FARM.

We have met here to receive and impart all the information we can in regard to a class of vegetable productions, that vary in size and use, from the little violet to the largest apple tree. All these as to use are in striking contrast to another class of vegetable growth, noted for its narcotic and bewitching qualities upon our race. Wherever the race of man is found, "on heathen or on christian ground," we find a portion of them who have stopped to dally with this latter class; who have become infatuated with its charms, and generally, ere they end their lives, they are bound slaves to its use. This class of plants have been aptly compared to the sirens of that lovely isle in ancient Greece, whose smiles allured but to deceive, and whose closer acquaintance and fondest dalliance was at the expense of health, and even the risk of life, to all who suffered themselves to be drawn within their charmed circle. We have not met here to discuss the merits or demerits of this class of vegetable growth, but we have gathered together from many parts of our beautiful and productive State to talk of the merits and beauty, and the best manner of producing the class of growth first mentioned; that class, of which might well be said, "A thing of beauty is a joy forever." Each of all this class in its way is beautiful; it leaves no sting. Each in its way contributes to the health, comfort and happiness of man, from the smallest flower placed in the hands of the sick child to the largest and most luscious fruit we feast our eyes upon. The acidulated drink of the lemon, the currant, the cherry, or the apple, the fully ripened and richly colored Rareripe, the golden bronze of the imperial pear, the many hued and richly variegated apple, the strawberry, the grape, the plum, the nectarine, the quince; each and all are good. I will step eulogy and only say that I believe no picture of the imagination was ever framed in one's mind, however highly cultured the person might have been, of the most lovely place they could imagine—call it heaven if you will—where even the streets might be paved with gold and silver; but the loveliest, the fairest, the best of all that beautiful imaginary landscape were the bordered pastures of flowers, the walks interspersed with here and there an arbor covered with noble vines, laden with ripened fruit, and scattered on every side here and there a tree, a shrub, a bush, whose fruit was for the health, comfort, and happiness of all the dwellers there.

Our main object in gathering here is, as I understand, to impart and to gain instruction from each other. In doing this, I suppose the first thing sought from others is their own practical experience, in whatever branch of culture they may for the time refer to. My principal experience has been in the setting, culture, and care of fruit trees, largely the apple, and I will now relate a few facts and incidents that have come within my own knowledge and observation, with some suggestions deduced from these facts.

No man ever has or ever will live long enough to tell you with perfect accuracy what varieties or kind of trees to plant and cultivate, as the very best adapted to your soil and lay of land. There are some rules that may be laid down that will be found so nearly true that they might almost be called axioms, like this: If a part of your farm lies higher than the other, is rolling sufficient to carry off the surface water quickly, not quick enough to wash away the soil, and the land is in good heart, and you wish to plant an orchard, that high rolling part is the land to plant your orchard upon, no matter whether it is situated just where you want that orchard to stand as to location or not. If your object is fruit you will plant there, though it may be half a mile from your house, and you may have to feed some persons living miles from your residence, those who through neglect, misfortune, or perhaps culpable negligence of their own, have no such choice fruit. After all this, which may try your patience and your temper, I will guarantee that you will have more fruit for your own use than if you were to plant upon the level, clay bottomed tract close by your buildings, so level that the water would stagnate at the roots of your trees before your could carry it off, do what you may. Other things connected with fruit growing may vary, as the shifting seasons come and go. Varieties of fruit that have done well for the past decade may not do as well in the years to come. My first practical experience in the care of fruit trees was in the spring of 1829, when after a short lesson in cleft grafting I was sent to graft several thrifty apple trees that had grown up in or near some of the division fences on the farm. When I last walked over a portion of that which once was my father's farm, the most of these trees were dead and gone; but two or three were standing; they all made productive trees and bore many bushels of choice fruit. I think it a good way to utilize such scattering trees. There is no mystery in cleft grafting; good judgment in placing the cions, a steady hand, and a quick, good eye to properly place in position the graft set are all that is required.

Since I came to Michigan I have set out and raised, either to maturity, or a nearly bearing condition, over 2,000 fruit trees with excellent success. I settled upon an entirely new farm. Of course it was the second year after I moved upon it before I could set a tree. The second year I set an orchard sufficient for the home use of the farm. After the first day's work in digging holes, I let the job of digging them to a young man, paying him the price of a day's work for each four holes dug. In this case the old forest roots were many of them green and had to be grubbed out. The holes were dug five feet in diameter, about two feet deep, the subsoil being gravel and sand, and the holes so dug were then filled with the richest surface soil. It was considerable work to set that orchard of sixty-four trees, but it paid me well. The fifth year from setting I took an even bushel of apples from one tree, a Belmont. I was satisfied in after years that I missed in management in letting the tree mature that amount of fruit. I should have clipped off when small three-fourths of the apples set. This tree, which had outstripped all its competitors in the orchard, did not recover from the drain upon its vitality in maturing that crop for years, if ever, and I think died before it was fifteen years old. I have become fully satisfied that more healthy, thrifty, well cared for young apple trees are ruined in this way than any other. Those men who can dig the holes and set anywhere from twenty to forty fruit trees in a single day, will never be troubled in this way; at least I never knew of one. Thus all methods and ways have their compensations. Of the sixty-four trees set the second spring after moving on my farm, I lost not one. Every tree made a good growth, and some of the new growth measured over three feet. I recollect I had to write and tell my Massachusetts friends of this, that they might know that Michigan land was not all swamp, or oak barrens. Michigan land had rather a hard name in New England forty years ago. In the main the inhabitants of New York and Ohio knew better, and perhaps rather got the better of New England on account of her ignorance and too implicit trust in the reports of United States surveyors.

In the spring of 1861–2 I set out my large market orchard of about 1,100 trees in one solid block of nearly twenty-five acres. The holes were dug as I dug them for my first orchard, five feet in diameter, varying in depth from sixteen inches to two feet, according to the soil, which varied from a heavy clay loam to a rather light sand loam. Ten holes were about the average of a day's work in this orchard. I commenced fitting this land by rolling under a heavy growth of red clover about the first of August, which would have made over two tons of hay per acre. A large plow and two yoke of oxen were used for this purpose. The land was then cultivated and sown to wheat, which yielded nearly thirty bushels per acre. As soon as the crop was harvested I again plowed the land to the same depth as before, thus bringing to the top the largest part of the rich vegetable mold, which was used to fill the holes when dug, and furnish pabulum for years to the young trees. As soon as the trees were set, which was done very rapidly, as I placed the trees in position while two men fitted the holes and filled over the roots, one man fitting the hole while I was getting the tree, so that the roots could quickly be placed in a natural position, when two or three shovelfuls of the finest, richest earth obtainable was quickly sifted over the roots. That tree was then left for the second man, who gently pressed down the earth and roots, filling up the hole a little above the surface with the richest soil obtainable within fifteen feet of the tree. As soon as the trees were set I had two teams drawing mulch from two or three old straw stacks that had been partly eaten and lain upon by stock. A wagon box of this material was used to every four trees. If memory serves me right I lost but three trees the first year from setting, which I attribute largely to this mulch. The ground was then plowed as soon as possible, marked in rows for corn in such a manner that each tree set occupied the place of a hill of corn. I planted corn in this way for three years. Notwithstanding the rapid growth made, perfectly matured apples were grown in this orchard the third year after setting; they grew on Wagener trees. From the fifth year these trees bore heavy crops; the limbs were propped up. They were encouraged to overbear, and to-day they are mostly dead or dying.

To one thing more do I believe myself largely indebted for the healthy and rapid growth of this orchard. I had thoroughly proved years before I set that orchard the virtue of long, hand-threshed rye straw, in protecting trees from all their enemies, whether mice at the surface of the ground, or rabits, or borers above, and even the worms themselves seem to shun the trees protected with this material. In the fall after setting, every tree in this orchard was spirally wound with rye straw from at least one inch below the surface to the branches. In the spring following it was taken off, and in June the trees were washed with a strong mixture of the best soft soap and water. Over a half barrel of soap was thus used. The pruning knife was used every month till October in restraining a too rampant growth in any one limb at the expense of others. In the fall succeeding all the trees were again wound with the straw, and this straw remained on the trees for nearly two years, gradually giving way to the growth of the tree, and at the same time proving a perfect protection to and from all their rodent and insect enemies. In all this time I never found on tree or straw one cocoon, miller, codling moth, bug, or worm, although I had hunted for hours at a time for them. I consider long, hand-threshed rye straw invaluable in orchard culture. I know that the seasons vary greatly in regard to the number of insect depredators, yet I cannot think these years so very exceptional that none would have been found in this orchard if there had been no straw winding there.

Owing to injuries received in the winter of 1863, from which I never fully recovered, I sold this farm in the spring of 1865. Soon after its present owner purchased it, he grafted over a block of over 100 Astrachans, the only early fruit set in the orchard. For want of proper care the borers got into nearly every tree, and a large per cent of the number were virtually destroyed by their ravages. For five dollars I could have wound those trees from two inches below the surface to the limbs, and my faith in rye straw is such that I would have been willing to have insured the trees from injuries by borers during the three years necessary to change their top for ten cents per tree, I to give five dollars for each tree destroyed that was kept fully protected as above described.

On the small place where I have lived the most of the time during the past fifteen years, I set something over 100 trees, and not having my favorite straw, I used various things for protection of these trees—newspapers, tarred paper, and hay bands twisted. Now if you want to call all the worms, millers, moths, etc., in the lot to a certain point, I know of no better way than to wind a young tree with a band of twisted hay. I believe that will fetch them every time, for I hardly ever searched without finding something of this kind, which I never found in pure rye straw. I say good, long, hand-threshed, pure rye straw, this, and no other. Who of you old farmers here assembled ever saw a scaffold of this grain, with the bundles all cut to pieces from the depredations of rats and mice? I doubt not you have often seen an oat scaffold in this condition, and perhaps one of wheat also. There is something repulsive to both rodents and insects, and I think worms likewise, in rye straw. As I have stated before, I never yet found a worm harbored in this material. There is perhaps a little art and skill or practice in putting it on a tree. Before I use it I set on end as many bundles as I think will be needed, and throw water over them, enough to slightly dampen the whole length of the straw. This should be done about two days before required for use, as it will take the water some little time to reach the bottom, and fully permeate and soften the naturally harsh straw. I commence to wind by taking about enough for a small band as used in binding grain; keep it as straight as possible, never twist it, hold it in the right hand with the heads down. A little dirt should have previously been removed from the trunk of the tree, which after winding should be replaced. I consider this a very essential point. With the left hand bring the heads close to the ground, with two or three inches of the tip turned up, so that the first turn of the straw will fasten them in this position; commence to wind in a long spiral the body of the tree. If your tree is small and the straw of good length, the straw first used will be all your tree will require; if your tree is larger two lengths will be required. The joining is but the work of a moment; a half hitch with a straw or two at the top fastens the whole in place, and when well done no part of the tree is exposed to sight, and the thickness of the band will vary from one to about four straws. So quickly is it done after a little practice that I bound, or wound, the whole of the trees in my large orchard of over 1,000 trees, with everything prepared and convenient to hand, in just three days, alone; and this work was so well done that, although the straw was left on the trees for nearly two years, I do not recollect of a single instance where the straw became separated from the tree from natural causes alone. That orchard was set in hexagon, like placing a pin for a tree in the center of each cavity of a honey comb. For a large orchard I like this form better than any other; for a small orchard I would prefer the square form. As to the real money value of a market orchard I cannot say. I recollect telling the man who purchased my farm (who at that time told me he considered the orchard of no value to the farm), that if he would take as good care of the trees in the future as I had done, within fifteen years the income from that twenty-five acres would be more than from all the balance of the farm. That orchard is now twenty-one years old. In 1880 the owner had over 1,600 barrels of apples scattered over the farm at one time, picked No. 1 fruit. In 1881 he had seventy barrels of No. 2 fruit, all told. This tells the story of the status of our fruit for a belt extending about six miles north and south, our village as the center of the belt.

A belt of about ten miles in width north of ours is mostly better land than we have here for orchard purposes. It lies higher and has on the whole a better drainage, two very essential points, as far as productiveness is concerned. Our apple buyers here purchased several thousand barrels last fall, but the largest half came from this northern belt. Never have I seen so large a proportion of defective and prematurely ripened fruit as the last fall gave within the Hudson belt. I picked and ate large well-ripened Northern Spys in the month of October, something I never did before. From three orchards of over 100 trees, where myself and children live, we cannot any of us show the first apple. Of all the best which were put in the cellars, fully three-fourths rotted. I am sorry we could make no better local show of fruit at this time. The past year is certainly an exception and not the rule. We can and usually raise good fruit in Hudson. I have detained you too long.

One word about pears. I have set in Hudson first and last over 100 pear trees. All my trouble and ill success in raising this fruit has been due to blight alone. For years I practiced the rule of setting two trees where one died. Blight has mastered me. I have surrendered. I have tried many remedies; all have proved alike failures. Either by chance only, or for some other cause, there has been with me a little choice in varieties. The Beurre D'Anjou and Flemish Beauty have done the best for me, out of over twenty different kinds tried. There are those here who can entertain and instruct you better than I can. Let us hear them.

President Lyon: I heartily agree with the essayist as to the importance of the thorough preparation of the places in which to set trees, but I would go still further than he and make the holes as large as the orchard; in other words thoroughly prepare the whole area.

Mr. Steere: Would not subsoiling be better than the method of digging holes and fitting them so nicely?

Mr. Peirson: No, I think not. I want the cream of the soil where the roots will at once take hold of it; and this can only be secured by preparing the holes as I have indicated.

Mr. Potter: I would subsoil, then plow again, throwing the surface dirt towards my lines of trees.

Porter Beal: I would like to inquire as to the profitableness of the Wagener apple.

Mr. Peirson: It bears young, but will last but a few years. Probably by judicious thinning its life might be prolonged and the variety thus rendered more valuable.

J. S. Woodward: I certainly should not dig holes and pay as much attention to fertilizing close about the tree. Why, gentlemen, in six months from the time a tree is set in the spring the roots will be a long ways outside of the hole if the tree does at all well. I don't believe in feeding a little pig very high and when he gets to a certain stage bring him down to ordinary diet. I don't believe in pampering a boy until he gets into his teens and then all at once submit him to the hardships of life. In the same way with a tree; I want it to have the kind of feed at the start that I can give it through its life; so I would fit the whole area of an orchard or fit none of it.

Mr. Peirson: I confess that I cannot agree with the gentleman. It is a good thing for a tree while enduring the shock of transplantation to have a little pampering, to have its food of the best kind and within ready access; by this means it will rapidly gain the vigor necessary to push out for its living.

Mr. Tracy: We are apt to forget how soon the roots get away from the body of the tree, and how soon there are few feeders close to the body. Long before the first growing season is over the roots have reached out and are feeding outside of any hole that a man would ordinarily make for it. Unless one has given special attention to this subject of roots he will be surprised at the distance they reach out. I have had a tile drain stopped by parsnip roots three and a half feet below the surface of the ground.

Mr. Woodward: I have set a number of orchards and have been fairly successful, and my practice has been based upon some knowledge I received by having a railroad bed cut through an orchard. I then found that apple tree feeding roots were principally out from once to once and a half the height of the tree, and there is where I put my fertilizers, there is where I want my ground in good tilth for the newly transplanted tree.

Mr. Peirson: Clay soil is different from sandy soil in its requirements. Upon the former I certainly should not dig the holes.

Mr. Stowell: In Michigan we are very much troubled with the borer if a tree has a sudden check. I have thought it wise to have a very nice bed in which to place newly transplanted trees so as to have as little check as possible on account of the borers.

Mr. Reynolds of Monroe had set five orchards and believed emphatically in fitting the entire area of soil alike, putting it in excellent condition.

Upon the same general topic of Horticulture as an Adjunct of the Farm, Mr. C. B. Stowell of Hudson gave the following hints on the

FARMER'S GARDEN.

The Garden as an Adjunct of the Farm comprises a wide field, and in the few moments allotted to me one only has time to go into it a little way, turn around and sit down. The farm garden consists of the vegetable, small fruit, and flower gardens, the last of which may be divided into window and lawn. The vegetable and small fruit gardens are usually one on the farm. The location, if possible, should be near the house, with but gentle if any slope, and not shaded on the south or east. The soil should be rich, or made so; if hard, put on plenty of coarse manure, leaf mold, and some sand if you can get it, If fruit trees of any kind must be cultivated there, put them on the north and west sides, leaving the main ground clear. Leave a space eight feet wide on both north and south sides to turn on. Begin on the west with a row of currants; eight feet from them, blackberries; eight feet further one or more rows of raspberries; then in six feet comes your grapes on trellises four feet high; then in six feet strawberry rows, three or four feet apart. One row of asparagus, which in spring is almost as good as a Jersey; then add pie plant, artichokes, and kindred things, after which your vegetable garden of lettuce, spinach, onion sets, peas, beans, sweet corn, early cabbage, early turnips, potatoes, carrots, radishes, and sweet herbs, in rows from three to four feet apart; then in five feet tomatoes. Further on cucumbers six feet, and finally melons and squashes eight feet apart. Some of these can be followed by late cabbages, turnips, and celery.

This method of sowing gives a chance to use the cultivator and requires but little hand work in comparison with the old time way of making the garden in beds.

I will not give directions for growing the various kinds of vegetables, as this can be found in seed catalogues, the farm journals, and on every package of seeds; but will only say that the farmer who will try a good garden will find his doctor's bill less, his wife pleasanter, because she has a chance for a change of diet and plenty of fresh fruits in their season for dessert, which is better and healthier than pie and cake; the children will love the home better because mother can make it pleasanter, and they enjoy the fun of gathering fresh fruits and vegetables for the table. There is also a saving of money in the farm garden, for a good one will furnish almost one-half the supply of the table during a large portion of the year.

Flowers, if any, are usually a separate affair. For the window garden, geraniums, heliotrope, coleus, fuchsias, callas, smilax, and most other green-house plants do well in warm rooms in east, south, and west windows; but for a north window light ferns, scented geraniums, primroses and many of the trailing plants will thrive better.

The lawn garden may be made gorgeous and grand, or neat and modest, according to one's means and taste. Ribbon beds of sweet alyssum, coleus, achyranthus, centaureas, and the like, make a very fine appearance, while geraniums, salvias, caladiums, roses, etc., make large and more showy clusters.

Usually Dutch bulbs can be set and are out of flower in time for summer bedding plants. It is more convenient to cultivate annuals, perennials and hardy shrubs each by themselves. A nice way for roses is to put them in rows or hedges where they can be mulched and kept clean. None are so poor but they can afford a little time and space for some flowers. The time is fast coming, if not already past, when you can find a place worthy the name of home where flowers are not cultivated. Once in a while a relic of the past is found who says, " What do you want of flowers? You can't eat 'em." We might say the same thing of rail fences, yet they have their use, and the home without flowers in the window or about the lawn lacks the refinement and taste which makes home a foretaste of heaven, a place to which tired feet love to go. Flowers are an index to refinement and taste, like music and good books, showing that in these times of harvesters and sulky plows, sewing machines and creameries, men and women too are coming again to Eden's gate, from which they were expelled of old.

Following in the same general thought, Secretary Garfield remarked that one's home and premises should be such as to engender pride in their owner. If one is proud of his home he will care for it, keep it painted and provided with all the conveniences and ornaments that his good sense and good taste will suggest; while if he has no pride in it, no matter how large it is, or how much money he may expend on it, the air of home will not pervade its premises. It is just so with a school-house. If the children are proud of their school-house, nothing will be ruthlessly injured, and so he had earnestly advocated always the bringing about one's home such tasty improvements as will give the owner real pleasure. This will tend to quiet the unrest which is so characteristic of Americans, that willingness, for a money consideration, to part with a home.

He called attention to a number of little matters of decoration that can be brought about the house that are inexpensive yet very attractive. Children enjoy live things, growing trees and plants and vines, even better than marble ornaments. After remarking at some length upon the fact that while a field of wheat was necessary to the prosperity of the farmer, still an orchard was a matter of greater interest to the entire family, he asked the audience to allow him to introduce one who was older in the experience of building houses and better qualified to interest the institute, and called upon Hon. Thomas F. Moore of Madison.

Mr. Moore opened his remarks by telling a story rather at the expense of the Secretary, and then said he was proud of the work of the Agricultural College in turning out into Michigan a class of young men who have had opportunity to cultivate good taste in the embellishment of homes; and not only this, but the ability to employ their knowledge for the benefit of the communities in which they live. He belonged to a generation which had had no such advantages, but he hoped that because the advantages had not been accorded him he was none the less appreciative of the value of this training to the people of Michigan.

There is no place where culture tells better than in the home; there is no place where good taste makes a better exhibition of itself than in the surroundings of a home, and there is no place where this culture and good taste have so great an influence for good as in our rural homes. Character, manhood, and womanhood are born of good surroundings. A boy grows into a better, nobler man by reason of a genuine love of a beautiful home. There are too many country homes without a tree or shrub or vine to which memories of childhood may be linked. He said he loved trees as he loved nothing else in nature. There was nothing that brought up such beautiful associations as a rest upon a hot day in summer under the shade of a noble tree. He was not a landscape gardener, still he could see great improvements in the surroundings of Michigan rural homes in the last decade. We have reached a point beyond the carving down of the forests and we are looking rather to their conservation; we are looking as a people more and more toward the embellishment of our farms; we are getting to a place where we can look out and feel there is something better and higher than the number of bushels of wheat, corn, or potatoes we can raise to the acre; we see the need of higher types of manhood and womanhood. The men who think are the men who govern, and the means that are used to guide the thoughts into good channels are blessed. He closed with the remark that he did not wish to sweep away all the old notions of thrift, economy, and value of labor, but the rather to engraft upon these ideas that will embellish them and make them more attractive.

Professor Beal said the remarks of Mr. Moore seemed to lead the way for a little experience and suggestion which he wished to relate concerning

COUNTRY SCHOOLS.

Towards the latter part of January I received a letter, the like of which I never saw before. I was surprised at the questions asked. I was much interested in it. The letter ran as follows:

NORVELL, MICH.,
January 20, 1882.

W. J. Beal, Esq., Lansing, Mich.:

DEAR SIR:—I take the liberty to enclose a rough draft of our school yard, with a request, if it would not take too much of your time, that you favor us with any suggestions that will aid us in making our school yard more attractive. At our annual meeting last fall the district appropriated $25 to buy trees to set in the yard, and as now is a favorable time to make up our order we would be thankful for your advice of "how to fix it."

The yard is located on a burr oak plain, nearly level, soil gravelly loam, in quite a bleak place, with yard fronting south.

We propose to have everything ready to set the trees next Arbor Day, and with an invitation from our school examiners hope to revive a drooping interest in our school.

Any suggestions you may be pleased to make will be cheerfully received by the School Board of District No. 3, of Norvell.

Very respectfully yours, T. B. H———."

Just think of the people of a school district in the State of Michigan who have become so stuck up, depraved, or esthetic as to want to make the school grounds more attractive! And then, too, notice that they have actually voted to use money for this purpose. They ask advice about the plan, and want to know "how to fix it." The writer says the place is now "quite bleak." Whoever heard of a school house in a bleak place.

All jesting aside, is not this a gem of a letter? I think it is written by a lady. I take this as a good omen for the country schools. Let us make the best of the example and see if we cannot get others to attempt the same thing. Verily, this must be the result of some of the good seed sown by our State Horticultural Society.

The people of the district in question propose to make a display over the matter on Arbor Day, and try to arouse a drooping interest in their school. This is the right way in which to do it. I studied the plan over with many regrets that the grounds were so small, only 120x128 feet. I will show you what I recommended. I kept in mind the location, the size of the place, and the use to which it is devoted. The trees and shrubs are all hardy, good, and easy to manage. The planting is quite thick on the west, for two reasons, viz.: to cut off the west winds and to conceal from view the cemetery, which is situated just across the road.

There seems to be a growing interest in the common schools, which manifests itself in many directions.

The State Board of Health, especially through their sanitary conventions lately held in several parts of the State, are discussing the houses with reference to a suitable supply of fresh air, drainage, and good water. The State Teachers' Association has several times had good papers and discussions on the condition of the common schools. The members of our subordinate and county granges often talk of this subject. The State Grange does the same thing. The State Horticultural Society is trying to fix up the grounds. The school is besieged on all sides. The new county boards of examiners are going to see that none but good teachers are provided. The Board of Health is making plans for suitable ventilation. The granges and the State Teachers' Association, and the teachers' institutes are going to keep agitating the subject. If these agencies continue to work, there is little risk in prophesying that the time will soon come when we shall all point with pride to everything that pertains to our country schools. Let us unite in the good work and keep the ball rolling. Let every one here who can muster courage enough, on his return home, go to work and see if he cannot do something this coming spring to benefit his school. There is no better place for doing a good missionary work. A model school here and there, scattered about the country, will act as leaven to bring up others in the vicinity. I wish to offer the following resolution:

Resolved, That in the opinion of the members of the Michigan State Horticultural Society, the grounds about a country school house ought to be at least one acre in extent.

Mr. Moore: I heartily endorse the resolution, and wish to offer the suggestion that the most promising method that occurs to me now, of awakening interest in the embellishment of our school grounds, is to elect women upon our school boards.

Mr. Tracy: One acre is certainly small enough. It has been often remarked that there was no use in arranging school premises with trees, shrubs, flowers, etc., because the "young ones" would destroy them. Now this is not true. See our experiment last year with school flower seeds. Out of sixty letters received by Secretary Garfield relating experience in as many schools, not one teacher mentions any difficulty of this kind; but on the other hand almost all of them speak of the interest manifested by the pupils in this work.

Mr. Helme of Adrian, said he could heartily endorse this view of Prof. Tracy's. We have nothing to fear from the children if we take hold of this matter. They will co-operate with us every time.

Mr. Woodward: I am a member of nearly all the State Horticultural Societies about us, and I don't think any one of them has taken up so valuable work as the Michigan Society has in this matter of ornamenting school yards. The other States will follow you closely. Down in western New York we are stirring up the matter. I think land is not so very valuable in this country that a whole acre cannot be afforded for the school premises. I would have no fence about the school yard, but would have every child in the district have an individual interest in some tree, shrub, flower, or fruit growing there. I would have a requirement so that our teachers would be examined in the general principles of horticulture.

Several gentlemen remarked upon the subject of fencing school yards, with varying opinions, after which Prof. Beal's resolution was unanimously adopted. After a piece of music the next paper was presented by Mrs. Mary N. Allen, of Rollin, upon

HORTICULTURE IN AND ABOUT THE HOUSE.

In the beginning God created man and woman, and gave them a garden for a home. That garden was the center of all attraction, and besides the springing flowers and singing birds, there was all manner of fruits in it that were delightful to the taste. Through disobedience that paradise was lost, but from that day to this the same idea has pervaded all civilized people, that no home is complete without its garden. Ofttimes, maybe, it is a poor apology, but the garden is there. Sometimes it is only one foot deep by three long, and so hedged in by brick walls that it only gets the sun when it is at its zenith; and then again perhaps it is reduced down to a few earthen crocks in a south window, but in that embryo garden is the inherent love for agriculture that is as old as mankind.

Our occupation has in it much of toil and labor; it has likewise much of pleasure and enjoyment. Necessary labor invigorates our physical constitutions, and we realize nearer than any other class the blessing for which the prophet of old prayed, "Give me neither poverty nor riches;" and if our gains are small we feel they are secure, not liable to be swept away by the next arrival from Europe or the next telegraphic dispatch from Wall street.

The farmer who, with a philosophical eye, can watch the progress of vegetation, from the bursting of the bulb in spring-time to the perfection of fruit in autumn, is in possession of sources of enjoyment to which the denizen of a city is a stranger. In the economy of vegetation there is enough to claim our unceasing wonder and praise. Though discord may pervade human organizations and thwart their ends, it never interferes with the operations of the Deity, whose works are characterized by perfection of movement in all their parts, each atom fulfilling its proper destiny.

It is the happy province of the horticulturist to watch and study the operations of this mechanism, and when by the aid of science he can comprehend its simplicity and perfection, there is a charm thrown around his pursuit commanding his most fervent admiration. The infinite variety interwoven in earth's garlands, from the humble lichen that clings to the sterile rock, to the majestic tree that towers far above our heads and not only shelters us from the noonday sun, but yields its luscious fruits for the health and nourishment of our physical being, affords numberless examples of wise adaptation, all tending directly or indirectly to promote the progress and prosperity of man. And then, when we realize the wonderful improvements that the science of agriculture has accomplished in the line of fruit alone, we almost wonder if paradise, as far as fruit is concerned, is not restored, and are ready to say with Marvell,

" What wondrous life is this I lead?
Ripe apples drop about my head,
The luscious clusters of the vine
Upon my mouth do crush their wine;
The nectarine and curious peach
Into my hands themselves do reach."

and exclaim with Downing, "A man who owns a rod of proper land in this country, and in the face of all the pomonal riches of the day, only raises crab apples and choke cherries, deserves to lose the respect of all sensible men," and I would add, all sensible women also.

More than twenty years ago, when we—my companion and I—commenced life together on a piece of land in Rollin, we fully determined, with the aid of the science of modern horticulture, to give our home, as far as fruit was concerned, a paradisical fullness, and as the years went by and one after another was added to our family, and as these additions proved to be all girls, we felt, as true citizens of the great American republic, those girls must be self-sustaining, there must be something for them to do on the farm; they must be taught to love their home, and their home must be sustaining to them.

So long rows of raspberries were cultivated on a sunny slope of a rise of ground, a peach orchard was set out on another piece of land, a vineyard was planted, and so on until we now have growing on that farm nearly all the fruits indigenous to our climate. And now when the fruit harvests come there are merry hearts and many hands to make light the work, for the girls know that such a percentage of all the fruits they gather belongs to them; and so our fruit is not only remunerative, but it binds closer year by year the strong home ties.

In times of great surplus, and when the market prices are low, beside the required amount of canning for family use, we dry many kinds of the fruit grown on the farm, and for this purpose we have a Zimmerman dryer, which does excellent work and is a great economy, for we are thereby enabled to utilize much of the fruit, both for the market and home that would otherwise go to waste.

I can give you no figures in regard to the fruit consumed in our house, for we never attempted to keep any record; but this much I can say, that it is a large factor of our daily food, and we literally have it in its fresh state the year round, usually carrying out what remains in the apple barrels in June, after strawberries are ripe.

And now let me say, while poets have sung the praises of agriculture from the time of Virgil down to our own Carlton, and politicians have been enthusiastic in their admiration of it, and have taken great pains to shake hands with the horny-handed yeomanry, particularly on the eve of an important election. These the farmer accepts for all they are worth, but will not allow much longer railroads to trample upon his individual rights, but demand justice from the politicians, and with reason he expects soon to see rings and monopolies forever swept away. Then in our rural homes and at our rural pursuits we shall feel we are serenely blessed, and with patience and perseverence we may remove the obstacles that lie in our path, remembering that we not only plant and cultivate for our own benefit, but for coming generations.

Mr. B. W. Steere was next called upon and responded as follows, by giving a short paper upon

HORTICULTURE ON THE HIGHWAY.

If we should judge people by the reckless destruction of fine old trees that have sprung up, or that have been saved from the original forest to adorn our highways, we might almost conclude that they are destitute of taste or love for the beautiful in nature. Such a conclusion would undoubtedly be incorrect. The Allwise Creator has not so inseparably united the useful and the beautiful in His works without a purpose. The trees, like the Sabbath, "were made for man," and undoubtedly the germ of a capacity to love and appreciate all of nature's beauties is implanted in every heart, though in many cases it may be buried out of sight, under the greed for wealth, the so-called pleasures, and the cares and petty ambitions of life. If the above view be correct, what better work can engage our horticultural and kindred societies than to cherish, cultivate, and stimulate by every available means this dormant quality into active growth and life, that all may enjoy the pure and elevating pleasures that result from refined and highly cultivated tastes.

As men never cut the transplanted trees on the highway, but confine the work of destruction entirely to the spontaneous growth, it is but natural to suppose that a little more fire wood, and the possibility of half a bushel or so more corn inside the fence, are among the temptations. With this in view in our efforts to save such trees, we can show up their useful qualities, especially those that put cash in the pocket, as the increase of the wheat crop, owing to shelter from cold winds, etc., can also explain that a row or group of trees, and sometimes even a single grand old specimen, is the very making of a place, and that to cut them away would give it such a bare and forbidding aspect that no man of culture would care to buy, though it may become ever so much of an object to sell. By such and similar arguments I have sometimes succeeded, where the very word beauty was like Greek.

An illustration. A man in this county cut some trees on the highway; also a few on the top and sides of a bluff. An eastern man, who desired a home in that neighborhood, liked the place, but cutting those trees spoiled the sale, and he told me he would have given $500 more for it with, than without the trees. Another had a fine, large oak in the road, between the house and barn. In an evil hour he was tempted to cut it. That place is spoiled, as that single tree was all that gave it any special character. Similar instances could be multiplied if there were time.

From the foregoing it may be inferred that I admire the thickets so often seen on our highways, and would do no thinning whatever. So far from true is this, that I should probably cut out more than most, as it is impossible for a crowded tree to arrive at anything like perfection; its life also will be shortened, as the ground being filled on all sides with its own and neighbor's roots, the elements necessary to healthy and long life will soon be exhausted; so I should say, whether in thinning or planting, give plenty of room. Study well the character of the kind in hand, and examine carefully the oldest you can find growing in fields, or other places where there has been no crowding, that you may form some idea of the room they will need when they are fifty to one hundred years old, and never for a moment lose sight of the grand idea that if your work is well done, its results will reach into the far distant future, and be enjoyed by generations better able to appreciate it than the present. Such considerations, however, do not invalidate the fact that an occasional irregular group, or even small thicket may greatly enhance the beauty of the scene.

In thinning out we should of course reserve as many kinds as possible, but should always save the longest lived where there is a choice. If trees are so crowded as to be flattened on one side, leave those having the most branches toward the west, and so if they lean, reserve those that incline to the west.

Sometimes, when two or three are so close as to have about spoiled each other, two, or even all may be left with good effect.

In thinking the whole matter over once more, I am more than ever impressed with the necessity of empowering properly qualified persons to decide what is best in all cases pertaining to this very important subject, that those who are ignorant of such matters may not defraud the public, and in so doing injure themselves.

Mr. Norton: I would like to ask Mr. Steere what is his opinion as to the best way to set roadside trees?

Mr. Steere: With the present lack of knowledge as to methods of grouping, and want of appreciation of the variety produced by proper grouping, I should favor trees in right lines along the road. But had I the planting of the road trees for any considerable district under my direct charge, with authority to do as I pleased, I should certainly place them in irregular groups, giving as much variety to them as possible.

Mr. Tracy: This can be accomplished very nicely too, by planting at the corners of farms, and varying the spaces between groups by utilizing both sides of the road.

Mr. Norton: Is it better to mix trees in the groups, or have each group of one kind of tree?

Mr. Helme: I certainly should mix the trees in each individual group.

Mr. Scott: I wish the elm might be used more for roadside planting; to me it is the grandest tree of all when properly grown.

Mr. Steere: Yes, it is a grand tree, but there are decided objections to it as a tree for ordinary highway planting. It is somewhat particular as to the soil upon which it grows; and it is very greatly injured by canker worms, when they once come into a locality. This last objection also holds against the basswood.

Mr. Scott: They can be syringed with Paris green solution and defeated.

Mr. Steere: But when an elm tree reaches fifty or sixty feet in height, this can be accomplished only with great difficulty.

Mr. Reynolds: Why not use fruit trees for highway planting?

Mr. Underwood: This question, it seems to me, is quite apropos. Fruit trees along the roadside would not only be beautiful, but would afford a luxury to the traveling public.

Mr. Steere: I am decidedly opposed to this. We plant trees on the highway for a permanent beauty to our country, and for refreshing shade. Neither of these objects can be subserved with fruit trees. They are dwarfish in growth, and comparatively short lived, and would require more attention to keep them in presentable shape than will ever be given to these trees. I would urge upon people to look well to the trees they are to plant out for this purpose. They are to be a permanent addition to the landscape during your lives; you cannot afford to make serious blunders. Each tree should be studied with a long look ahead to its ultimate proportions.

Mr. Gibson: I must say that I am still in favor of planting some varieties of fruit trees on the highway. They will cheer many a traveler more by their fruit than an elm would with its shade.

Mr. Woodward: I wish to cry out against this everlasting utilitarianism of Americans. Plant trees on the roadside for beauty; select them with great care, so their growth will embellish the landscape. There is room enough on your farms for fruit trees.

Mr. Healy: I wish the American chestnut could be used more as a highway tree. It does very nicely with me, and I admire its proportions.

Mr. Woodward: The hornbeam is a tree that will bear using for this purpose, and it will grow in favor wherever people shall start to plant it.

Porter Beal: I can see great beauty in a fruit tree. It seems to me there are some varieties of our fruit trees that could be selected for roadside use that can scarcely be surpassed for beauty; and I have thought that were fruit trees planted on the road they would become a great protection to our orchards by furnishing fruit near to the travelers.

Mr. Steere: Dwarfish varieties might be planted between other trees, to be afterward removed when the forest trees are ready to occupy the space; shrubbery might be employed similarly.

Afternoon Session.

After enjoying a feast of good things prepared for the guests in Peirson's hall, a large audience gathered again in the opera house. President Harkness of the Farmers' Club occupied the chair. A duet was nicely rendered by Mr. A. D. Brown and Miss Schermerhorn, and prayer offered by Rev. Mr. Colton.

HONEST PACKING

was the first topic for discussion.

E. H. Scott: Honest packing is the key note to permanent success in market fruit culture. The man who wishes to make his mark and at the same time make money will have every package—be it a barrel, basket, or box—as good at the bottom and in the middle as it is at the top. He will pack it so that when his name and full address are placed on the package honor will be reflected upon him by the purchaser.

Mr. Healy: Very few farmers or fruit growers seem to take this view of the case, judging by what is placed upon the market; honest packing seems to be the exception.

Mr. Slocum: It is not farmers so much as packers that are in blame in this vicinity.

Mr. Childs: How should a barrel of apples be packed?

Mr. Healy: In short, even in form, color, and perfection throughout the package.

Mr. Pearsall: My practice has been to face my barrel with medium apples, not the largest nor smallest, sometimes with two and again with only one layer. I pick the apples in a handled basket that will easily slip into the barrel and turn over. Then the barrel can be filled without bruising the fruit. I try to put even sizes in the different barrels and mark accordingly. My name and full address are placed on the head of each barrel.

Mr. Healy explained how a man may acquire a reputation by honest packing and how easily he may lose it by having his packages overhauled in the great markets and inferior fruit placed under his brand. The only way is to follow your fruit pretty closely.

Mr. Steere: It behooves us to learn to pack honestly and well, for it will not be long before the foreign demand for our apples will be something enormous.

Mr. Woodward: We pack apples egregiously in New York, and from what you say I judge you don't pack much better in Michigan. Now there is certainly money in doing this business honestly and well as truly as any other. The day is at hand when the money on fruit will depend upon honest packing.

Mr. Stowell: Two car loads of apples were sent from here to Sweden last year. We do not want to make mistakes in packing when we seek a market abroad.

Mr. Gibson: I am a fruit packer and want to put A No. 1 apples on the market; but when I do a large business and buy apples in large quantity, putting packers in the orchard with instructions, I find oftentimes that a good dinner at the farmer's table and a little of the "O, be joyful," between meals, have more influence than my instructions, and the result is that a great many apples go into the barrels that ought to go into the hogs. I wish farmers would pack their own apples, put on them a guaranty, and sell to the dealer who will pay the highest price.

Mr. Moore: I never should do this; but the rather sell the fruit in the orchard outright to the man who would give the best bargain, and would simply guarantee the packer that his men would get no whisky at my house.

Mr. Dayton: I am also a dealer and would much prefer that the farmer pack his own apples. They will run better than if I hire them packed myself.

Mr. Peirson: The sentiment about Hudson is that the packer will put more apples into barrels from the same orchard than the owner of the orchard would dare to do, hence the orchardists prefer the packers should do the work and take the responsibility.

Porter Beal: There seems to be several grades of honesty. I find the same grade of men who yesterday or this forenoon advocated "enlivening" the packages by means of colored netting, this afternoon urging that there be greater honesty in packing. It seems that a grade of honesty that is good for one set may be pretty tough for another.

Mr. Tracy explained that the netting would only heighten the color already there, but would not hide deformities. It is not deceitful for a man to wear such clothes as will well set off his person.

The next subject was

THE KNIFE, WHEN AND WHERE TO USE IT.

Upon which President Lyon remarked at some length, illustrating his points with blackboard and crayon. The following only catches at the points he made:

Nurserymen are compelled by the low price of trees to grow them too closely together for their uniform development; hence the younger the planter gets his trees the better, yearlings being better than two-years-olds, and these in time better than three and four-years trees; this, provided the planter will properly care for the trees when they are purchased. The thumb and the finger should precede the knife in the growth of the tree. Roots of the young tree, in planting out, should be cut with a sharp knife to make what is termed a "clean cut." If the tree is in the form of a whip, cut off to a good bud about two feet high. The trunk should be shaded as soon as possible by the top, hence the short body at first.

His ideal tree was a central shoot with four or five side branches distributed over about a foot of space.

Mr. Collar: Would you cut out the central shoot?

Answer: By no means; I do not want "umbrella trees."

Mr. Lyon remarked that if larger trees are set out, cut back the side branches to single buds, and by arranging the cut according to the way the buds point, a uniform head can be planned. The trunk should be covered, or better still, washed with soap suds at time of planting.

The best methods of pruning peach trees, to avoid crotches, were discussed, and the reasons for what is known as the "shortening in" process were given.

Mr. Satterlee, of Greenville, addressed the institute for a few moments on the subject,

ADVERTISING AT FAIRS,

Taking the ground that with horticultural products it is true that it pays to show samples at fairs that will advertise the home product. A district or locality which may have a surplus is thus brought in contact with the buyer, and again the competition for prizes educates as to what is valuable and what is not, as well as to methods of picking, packing, and exhibiting.

Mr. Woodward being called out said it paid him to advertise at fairs. He didn't want any committee to pass judgment on his fruit; he wanted the judgment of the people who passed through the fruit halls. If the people, after viewing and tasting his fruit, commended it, their judgment was worth more than any viewing committee of two or three members. The fairs were the best places in the world to advertise new fruits.

A FEW QUESTIONS.

Mr, Stowell asked what was the best market peach for Southern Michigan?

Mr. Dorr: From my experience I should answer unhesitatingly, Hill's Chili.

Mr. Parshall: Yes; by all means. They are about as hardy as oak trees, and that is what we are after first.

Mr. Woodward, of Clinton: My record of last winter's disaster does not place Hill's Chili first for hardiness.

Mr. Healy: Same objections apply to it as to Wagener apple. It overbears and is short-lived, and it is expensive thinning the fruit so the remainder will be marketable.

Mr. Steere: Hill's Chili is of good quality, a good canning variety, and has a small pit. I like it.

Mr. Dorr: Good soil makes good Hill's Chili; possibly the soil on the lake shore is not good enough to grow this variety.

Mr. Healy: The better the soil the more prolific it is, the longer the wool on its surface.

Mr. Lyon: I confess your experience here is very different from ours on the lake shore. There we call it a poor peach in quality, and I think, take the record of the variety generally, and you will find yourselves singular in this respect.

Porter Beal: A good judgment may generally be based on the calls of the consumers, and they always want more of Hill's Chili.

Mr. Stowell: What is the best keeping grape for our climate?

Dr. Owen: In my experience the Isabella stands best, but my location allows me to ripen it well. I ate my last ones only a few days ago.

Mr. Satterlee: As a long keeper I like the Agawam very much.

Dr. Owen: I keep the Clinton until February.

Mr. Lyon: The main objection to all the long keepers is that they are not good enough, but I suppose we must put up with that. The Diana keeps well and so does the Salem.

Evening Session.

After music, the first paper of the evening was given by Mr. A. D. Healy, on

EDUCATION AND HORTICULTURE.

It is not possible for one who is uneducated to grow beautiful flowers, fruit, or vegetables, for with him it is nearly all a mechanical process. But if there is a spot upon earth where a good education and a high order of intelligence are required, it is in the garden and orchard; and the want of this is the cause of so many failures, or if a partial success is obtained it seems almost a matter of chance. In the beautiful gardens and parks that adorn our cities the head gardeners are educated men; they are prepared to explain all about the plants under their care, and of any plant growth that adorns these beautiful yards and parks. They are familiar with foreign as well as our domestic fruits; in fact they are educated to their business as well as the best of our doctors, lawyers, or teachers, etc., and often very much more thoroughly, for they love their chosen occupation for something more than money. The result is, the gardens under their care always look beautiful, which is often wrongfully attributed to the supposed superior advantage they may have in soil or location, when the fact is, their success entirely depends upon their knowledge of the business.

It costs no more to make a rose bloom in Lincoln Park, Chicago, or Central Park, New York, than it does in the humblest farmer's yard. The extra cost involved is in the large number of roses made to bloom, and the superior character of the beds in which they are planted. Our horticulturists as a class are highly intelligent, and it is to that we owe our remarkable success in horticulture. The little wild blackberry has developed into that magnificent Kittatinny: the apple has been increased in size, beauty, in color, and enriched in flavor; the peach, from the little fuzzy, bitter, worthless thing to the grand Oldmixon, or the monster Susquehanna. In fact, the whole catalogue of fruits can scarcely be recognized as descendants from the old time fruits.

But let us not forget the advance in flowers. I will only name the pansy; why, just stop and think, and compare it to twenty years ago, and upon all this progress glows unmistakably the evidence of a high order of intelligence that alone would accomplish such results. It would be unjust not to give patience and industry credit for what is due them: both have played a prominent part and helped us on to success in developing our pursuits. It is no lazy man's work to be a successful gardener or fruit grower, although for me it is the most delightful work on earth. Nor is the orchard or the garden the place for him who expects success, unless he is willing to plod along in the ruts which others have worn. Many a one has tried and failed, tried and failed again, but they have accomplished something; nearly all of our new fruits, flowers, and vegetables have come from many attempts and many failures. The young man who contemplates entering the field of horticulture for his avocation needs to remember he is engaging in a beautiful and interesting work. That absurd and ridiculous idea that ignorance and farming in any department are compatible, and which has in the past been more or less prevalent, has been abolished, and it is now an acknowledged fact that to be a successful farmer education is as essential as the plow or cultivator; and it would indeed be very hard to say in what branch of horticulture or farming it is most needed. Education will tell in the corn field, in the wheat field, in the orchard, or in the flower and vegetable garden.

It is not supposable, nor will it do to think, that we can all make good horticulturists. Men are not only born poets, but farmers, statesmen, and horticulturists. I think every man possesses some talent for this work, and it is one of God's choicest gifts; therefore develop the spark, though it be ever so small, and it may result in some great achievement. Young men, honor the soil. Fathers, teach your boys to love this work, and encourage them by giving them some land for their own use; let them plan and work it according to their own fancy, but exert your influence to have them make it look beautiful, and by so doing you will teach them to appreciate and love the beautiful in nature, and they will soon learn there is some honor in being a farmer, fruit grower, or gardener, and consequently will shun the dry and toilsome life of a clerk in town.

Mothers, do not let the fathers give the boys all the chance of the farm, but educate your daughters to understand farming, for they can make just as good horticulturists as the boys, only give them a chance. I admire the young lady who can leave the piano or parlor and go to the garden with the hoe independently and happy, and think it just as honorable as to be called school-ma'am.

"Honor and fame from no condition rise;
Act well your part, there all the honor lies."

Secretary Garfield being called out upon the subject of

HORTICULTURE IN SCHOOLS,

responded briefly, and with a copy of the report of the Society in his hand, gave a short history of the State Society. Just how to go to work to have the germ start to grow in our common schools was the hard task to overcome. Fine theories and frequent discussions did not reach the difficulty. Finally Professor Tracy of Detroit was consulted, and his suggestion was tried, which was to ask seedsmen to offer seeds gratuitously to all teachers who would apply for them. D. M. Ferry & Co. of Detroit offered to supply the seeds providing the teachers would agree to plant them with the help of the children, and in the fall report the result to the secretary. The teacher was to apply to the secretary or D. M. Ferry & Co. for seeds. The trial was made and it was a grand success, as the fifty or more reports fully testify, some of which would be found in the annual report of the society for 1881. Mr. Garfield gave a number of instances and extracts from the reports, which were listened to very attentively by the large audience. He said the same offer of seeds was open to teachers this year, and he hoped every one in the audience would go home and stir up an interest in this matter.

Mr. Steere recounted the difficulties he had overcome in getting a plantation of evergreens in the school yard near his own premises. There seemed such an apathy on the part of the people that he was well nigh discouraged.

Mr. Pearsall urged upon parents the duty of following their children to school and making the surroundings pleasant there in the same way they would at home. A large part of the wakeful hours of children is spent in and about the schoolroom. It is of the greatest importance that the surroundings here be such as to exert a healthful influence.

Mr. J. S. Woodward: A German prince was complimented at one time on his excellent management of his kingdom. He responded by placing his hand on the head of his little boy and saying: "This little fellow is ruler of my realm." An explanation being asked, he replied, "Why, his mother rules the prince and he rules his mother." This is a good deal so concerning this school horticulture. If this society can only get hold of the children there will be no trouble about the rest. The school-houses and yards will be fixed up and the whole country will be rapidly educated in this matter. We have unearthed an old law in our State that allowed certain funds to be used for school library purposes. Now we propose if possible to have something done by which this money shall be employed in fixing up school premises. Our Western New York Society have set to work about it and we hope to do something. James Vick has made a liberal offer to people in our State who will help embellish the school grounds, and I believe there is to be a "boom" in this business.

Dr. Woodland Owen next read a short paper on

HORTICULTURE IN THE HOME.

A short paper was next read by the Secretary from the pen of R. T. McNaughton of Jackson on

HORTICULTURE AS A PART OF INDUSTRIAL EDUCATION.

In the education of to-day, as in most other things, the tendency of the times seems to be toward a very practical result, and the demand is less and less for that mental training which gives a familiarity alone with higher mathematics and with the history of by-gone ages taught in the literature of a departed race, and more and more for an education which teaches men the principles which directly underlie their profession or calling. People, especially in this country, require a schooling that will be of practical and well defined use to them in business. Hence the demand for industrial schools and colleges where are taught the art and practice of various professions. It is coming to be a common thing for young men to seek to get an education at a school where they can at the same time apply what they learn, in the shop or on the farm in actual practice, and thus in a measure learn their trade at school. This being the case, I claim that it is wise to give horticulture a place among the industries practiced at such a school, and why?

First, because the different branches of gardening are good trades in themselves, and if taught at such schools young men can be made to see it. And it needs but to bring the matter to your notice for you to agree that the graduates of such schools can but elevate the business and help make it an honored calling, while the business itself is likely to make its followers happy, being one of the best and most satisfactory pursuits in which a man can engage.

And, secondly, it is well to encourage it in the schools because for men of almost any business it is pleasant to know something of gardening, and the different processes in fruit, vegetable, and flower culture, like pruning, grafting, and budding, transplanting, combating insects and diseases, sowing seeds, using manures, employing hot-beds and forcing houses, propagating, etc., etc., can be very well taught to some extent in school, or at least the principles of vegetable growth can be inculcated with profit to the learner and pleasure in after life. For example, in the college in our own State this is done every year. Scores of students preparing for farming, gardening, and other pursuits take the course in horticulture. And think you not that whether or no they make gardening their business they will have the love of the work and some knowledge of its practice fixed in them? And it will find expression too in better vegetables in their gardens, a finer lawn and shrubbery about their doors, vines clambering over the walls, or flowers in the house, or fruit on the table, or something to make life pleasanter, and to "add to the garland of the useful and beautiful that encircles this excellent old earth."

The next subject was the influence of

ASSOCIATIONS IN EDUCATING HORTICULTURISTS.

Mr. Lyon in announcing it remarked that we could not all go to College, and many of us had not even had a very good chance in common schools, but there was a means of education which he considered of the greatest importance and that was associated with the topic announced. To the horticulturist this is of great importance because of the rapid development of his profession at the hands of skilled men who become the teachers in institutes, conventions, and meetings devoted to horticulture.

Professor Tracy upon being called out said that seventeen years ago he had been pointed to the Michigan Agricultural College as the only successful institution of the kind which gave any attention to horticulture. He came from Boston, the seat of learning in America. He found what he wanted here in a western State and had remained in the State since leaving college. He had witnessed very wonderful developments in horticulture in these years. He gave an interesting narrative of the steps of progress since he first stepped into the State. A few years after coming here, while a teacher at the college, he heard of the meeting of the Michigan Pomological Society at Grand Rapids, and attended it and gave the names of four others besides himself who attended that first meeting of this great society. Thus it began, and to-day we find a good supply of horticultural products all over the State, and a great deal of this benefit came from the work of this society since that meeting. The Professor related many very interesting reminiscences that have occurred since that time; among which was an account of an early exhibition of apples. He then contrasted the exhibitions of to-day with that one and stated that Michigan has the faculty of putting on exhibition a class of fruit that carries off the premium at almost all the important fairs, the result of the work of this society. It is doing a grand work, and is constantly spreading its influence by organizing branch societies all over the State, and he gave the plan by which its work is done. He paid a fine tribute to the State as a horticultural and pomological State with the grandest facilities in the world.

President Harkness said he had learned something of what might be learned by such meetings as this one by the progress here, and he believed the influence of this meeting would be long felt, and must be a lasting benefit practically as well as scientifically.

Mr. Pearsall spoke of the joy it gave him to see so many here, and he felt as though he wanted to sing "Praise God from whom all blessings flow." No bad people ever came from the influence of horticultural societies and associations.

Mr. Stowell gave notice that on the 16th a meeting of the Union would be held, when steps would be taken to organize a branch horticultural society, and invited a full attendance.

Dr. Fuller gave a little experience in his efforts to organize a local society at Eaton Rapids, which had been successfully done.

Porter Beal, of Rollin, then took the stand and spoke on "Experience and Observation in Horticulture." Our daily occupation has much to do with the formation of our character, and the subject we have had before us has had the tendency to make us better, love our Maker more, to help each other, and to benefit the age in which we live. We never expect to stop learning, even though we are old and gray. Mr. Beal's remarks were of wide range but all valuable and good.

The music was the next thing in order, and was given by Miss Emma Schermerhorn, in a solo, accompanied by Mrs. Van Akin, who so skillfully and faithfully had rendered the sessions all through so pleasant by her artistic playing. Everybody could but feel a strong sense of gratitude to Mrs. Van Akin.

REPORTS OF COMMITTEES.

The Committee on Credentials reported the following visitors from abroad in attendance at the Horticultural Institute:

J. J. Parshall, Ann Arbor; S. W. Dorr, Manchester; S. R. Fuller, Eaton Rapids; John S. Williams, Kalamazoo; D. G. Edmiston, B. W. Steere. Dr. Owen, Peter Collar, Adrian; J. H. Jones, Kalamazoo; Prof. W. J. Beal, Lansing; T. T. Lyon, South Haven; W. Rowe, C. W. Garfield, Grand Rapids; Jas. Satterlee, Greenville; E. H. Scott, Ann Arbor; E. M. Potter, Kalamazoo; A. D. Healy, South Haven; Prof. W. W. Tracy, Detroit; M. T. Cole, Palmyra; H. D. Cutting, J. S. Kies, Geo. D. Kies, D. R. Gibson, David Woodward, Clinton; J. S. Woodward, Lockport, N. Y.; W. Hughes, Hillsdale; S. B. Mann and wife, Lenawee Junction; Thos. F. Moore, Madison; E. H. Reynolds, Monroe; S. M. Pearsall, Grand Rapids; Jas. Cook, Raisin; Woolston Comfort, Tecumseh; Jas. W. Holmes, Wm. S. Wilson, Adrian; Geo. Hall, Blissfield; P. F. Chambard, Fayette, Ohio; J. Newton, Osseo; J. C. Sterling, Monroe; G. W. Fisk and wife, Coldwater; Thos. H. Montgomery, Ridgeway; Yorick Gray, Hillsdale.

The report of the Committee on Fruit was then made by Mr. Wm. Rowe, of Grand Rapids, chairman, as follows:

Your committee find exhibits from the following persons:

Manly W. Maxson, Hudson, eight varieties: Lady Apple, Jonathan, Lady Sweet, Roxbury Russet, Green Sweeting, Yellow Bellflower, Newtown Pippin, and Rhode Island Greening.

Orrin Pierce, Hudson, three varieties; Lady Apple, Roxbury Russet, and Red Canada.

P. F. Chambard, Fayette, Ohio: eight varieties: Belmont, Jonathan, Fallawater, Newtown Pippin, Dominie, Evalt, Grimes Golden, and American Beauty.

Y. Gaay, Hillsdale: Belmont, Baldwin, Peck's Pleasant, and one plate of mixed varieties.

B. W. Steere, Adrian, five varieties: Nick-a-Jack, Baldwin, Ben Davis, Willow Twig, and Red Canada.

S. W. Dorr, Manchester, four varieties: Baldwin, Maiden's Blush, Sweet Bough, and Early Harvest.

E. H. Scott, Ann Arbor: plate of apples name unknown.

Two specimens of Russet, sent in by Mr. Parker, of Eaton Rapids.

Mrs. J. O'Mealey, Pittsford, one plate of pears, Glout Morceau.

Mrs. C. B. Stowell, Hudson, sample dried pears.

Sample of dried apples and peaches by the Williams process, exhibited by Mr. Williams of Kalamazoo.

Considering the extremely dry summer and the premature ripening of fruit in the fall, your committee unite in the decision that the exhibition is worthy of credit for the fruit exhibit at this time of year, especially when such varieties as the Sweet Bough, Yellow Harvest, and Maiden's Blush are in such good condition as exhibited by Mr. Dorr, of Manchester. These, of course, were kept by the refrigerator process and show what can be done.

Your committee hope that the exhibit here will stimulate our horticultural friends in all our future meetings to bring out their fruits and place them on our table, that we may all gain knowledge therefrom, and return to our homes wiser and happier people.

All of which is respectfully submitted.

WM. ROWE,
D. R. GIBSON,
J. S. WOODWARD,
Committee.

The Committee on Resolutions made its report as follows:

Mr. President and Members of the Michigan Horticultural Society:

Your Committee on Resolutions would respectfully submit the following for your consideration:

Resolved, That we tender our sincere thanks to the Lenawee and Hillsdale Farmers' Union, the citizens of Hudson, the various committees of reception, entertainment, etc., for their cordiality and hospitality; to Mr. Peirson for use of his hall for the "picnic dinner," and to any others who may have helped to make this meeting a success.

Resolved, That our especial thanks are due to Mrs. T. W. Van Akin, Misses Schermerhorn, Colwell, Dawes, Colton, Minnie and May Beach, Carter and Goodnow, Mrs. Brooks, Dr. Smart, and Messrs. A. D. Brown, Childs, Wing, and Guy Maxson, for the very excellent music furnished for the occasion.

Resolved, That we tender our obligations to those who have contributed fruits for exhibition.

Resolved, That we return our hearty thanks to those who have furnished papers upon the different topics presented, and to those who have participated in the discussion of the scheme in all its phases.

Resolved, That we return thanks to the press of Hudson. Also to the representatives of papers in other portions of the State, and to any papers outside of our State who may have representatives here.

EVART H. SCOTT,
H. D. CUTTING,
S. B. MANN,
Committee.

The Institute was closed with the utmost good feeling on the part of all.

THE SUMMER MEETING,

HELD IN PENTWATER, JUNE 20 AND 21, 1882. MINUTES OF DISCUSSIONS AND TEXT OF LEADING ADDRESSES.

The Oceana County Horticultural Society invited the State Society to hold its summer meeting in Pentwater, claiming that much good would result from a gathering of leading horticulturists in this comparatively new fruit region. In accepting the invitation and planning the programme no account was taken of the arrangement of trains, and later it was ascertained that our usual custom of opening with an evening session must be dispensed with, for but one train each day reached Pentwater, and that one late at night.

A goodly delegation from abroad entered Pentwater Monday evening, June 19th, and was met by the Committee on Reception and taken to the pleasant homes of the hospitable citizens. Mr. H. A. Cross, of this committee, was indefatigable in his exertions in behalf of visitors during their stay, anticipating the wants of delegates and providing admirably for their entertainment.

On the morning of the 20th carriages were provided and all were given a ride in various directions from town. The lake shore, Mears, and Hart were visited, and by two o'clock all had returned from a most enjoyable trip, ready for the opening session of the convention.

At three o'clock the meeting was called to order by President Lyon, who introduced Mr. C. A. Sessions, President of the County Society. Mr. Sessions gave a brief and appropriate address of welcome. He said the fruit growers of Oceana welcomed this gathering of the State Society as children welcome a parent. We are students in horticulture, just now enjoying the primer lessons; we are desirous of making rapid progress toward higher attainments. We are young in pomology and need your assistance. We shall take the liberty of asking you a great many questions, and will listen attentively to your replies. We shall be glad to tell you of our county, its progress and promises. We shall take pleasure in showing you our beginnings, asking you not to criticise too harshly, for we have made our improvements with our own hands amid difficulties; but we most cordially invite you to make suggestions for our good, and guarantee the earnest support of our people in forwarding the good work of the State Horticultural Society.

Mr. Lyon responded pleasantly, calling attention to the fact that the State Society, while it was doing the work of a missionary, was also gathering information and strength by means of which to prosecute well its own work; and never a meeting goes by out of which there does not come something good for even the pioneers in our organization.

The first topic for the afternoon was now taken up:

WHAT SOCIETIES DO FOR HORTICULTURE.

Mr. Wm. A. Brown of Stevensville, Berrien county, opened the way for discussion with the following paper:

The best results obtained in horticulture come from the persistent efforts of individuals who love to see a plant thrive or a tree grow. Horticulture is preëminently progressive, and the great improvements which have been accomplished in propagating and disseminating new and choice varieties of fruits and vegetables, the invention of new appliances and implements for the destruction of insect enemies, and improved modes of culture, are the work of men who have given their hearts, heads, and hands to developing what is best and most beautiful in nature.

The man who labors through long years to produce and perfect a new plant, fruit, or flower cannot be actuated by selfish motives. His work must have God's sunlight, and is open to the inspection of all. He is far removed from the professional inventor who complicates labor-saving machinery, having in view a patent which may insure him millions. Perchance he was educated to grace one of the professions, but he has no affinity with trade, medicine, or law. He works hand in hand with nature, and worships God as revealed in bud and bloom, and in the full fruition of his handiwork.

The ideal horticulturist is communicative; he loves to impart and receive instruction and coöperate with workers in the same cause, hence the early formation of the state and national horticultural societies of the country, some of which have been in existence more than a generation, and have made records which are invaluable in showing us what societies may do for horticulture. In the New England States every township sends one or more representative to the Legislature, agriculture and horticulture being fully represented. These industries have been encouraged and fostered by liberal legislative enactments. The great prairie States of the northwest have endowed their industrial societies with a liberal hand. Horticultural societies have been organized and have worked with commendable zeal; but repeated disasters have cooled their ardor, and as the true pomologist will not labor when he cannot hope for success, many have returned to the lake States. But the horticultural societies of the trans-Mississippi States will never say "die." If they cannot grow the fine fruits they can grow bread and meat for the world. The more hardy fruits will be utilized, and the young emigrants of to-day will live to see pomological products guarded and protected from the prairie winds by a cordon of native forests.

In considering what societies are doing for horticulture, we will allude briefly to what nature has done to render our beautiful peninsula State the chosen home of the enthusiastic horticulturist and the commercial fruit grower. Protected from cold northerly winds by the largest bodies of fresh water in the world, with a lake shore belt hundreds of miles in extent, with inland elevations which feel the softening influences of the lakes from afar, with a warm, prolific virgin soil, and being located midway on the great natural highway which connects the varied industries of the country, we can trace the design of the great and beneficent creator and adjustor of the universe in placing a fruit garden in the midst of the continent which will insure for all time a supply of God's excellent gifts to man.

It is nearly thirty years since the adaptability of the Michigan lake shore for producing fine fruit began to be understood. The fact that peaches and other fruits flourished and survived the severest winters was discovered by the early pioneers, and scientists demonstrated the phenomena of water protection. About the year 1860 horticulturists were attracted to the new fruit Eldorado from the east and west, and from the older parts of Michigan. Many of the new comers were experienced fruit-growers, and familiar with practical modes of culture, and planted varieties which had succeeded in other localities. Others came with crude ideas of fruit culture; they studied foreign books which taught the science of the business, and looked with contempt upon their neighbors who would not denude the trees and vines of their foliage, that the sun might ripen the fruit. Many costly lessons were learned before local pomological societies were organized, and fruit growers began to learn the causes of success and failure. Trees became known by their fruits, and thousands of worthless varieties were cut down and cast into the fire.

In the Michigan lake shore country the most of the pioneer fruit growers were men well advanced in years; but few were too old to learn; and as the fruit interests developed in different localities, societies were formed and the numerous questions connected with their avocation intelligibly discussed.

The work of this section was almost exclusively pomological; what to plant, modes of culture, adaptability of soil to certain purposes, insect enemies, markets, fruit packages, and transportation were questions that could not be solved without coöperation. Constant changes occur which may affect any or all of these questions, and the ground must be gone over and over again, and still the end is not reached.

To isolated communities of fruit growers the question of transportation is a serious one; they must make the business of sufficient magnitude to pay transportation companies before they can expect cheap rates. If land and water lines compete, give the whole business to the route which is most prompt, speedy, and reliable. Horticultural societies "all along the line" can make favorable terms where individuals would fail. The State of Michigan should be proud of, and grateful to, the State Horticultural Society for persistent and indefatigable efforts in fostering and rendering prominent the fruit growing interests of the State. Organized by a few disinterested horticulturists who foresaw the magnitude of our fruit interests, and who manifested their confidence in the permanency of the society by the bestowal of the life membership fund, the State society has worked faithfully, until the State no longer ignores the utility of the efforts of the society in developing one of the greatest industries of the State. During the pioneer days of horticultural and fruit growers' associations, the efforts of the State society were not fully appreciated by many of our local societies. The recent adoption of the local societies by the "parent" society has, however, removed all cause of jealousy, and the meetings of the State society in bringing together representative workers from all parts of the State are resulting in permanent good to horticulture, pomology, and to æsthetical embellishments throughout the State. Agriculture and horticulture have not ranked among the sciences; but the aid of science in developing the primary and most important sources of wealth and prosperity has been recognized in our State by the endowment of the State Agricultural College. Although the faculty of the college have been obliged to do double duty, horticulture has not been neglected at Lansing; and we are glad to observe that many of the graduates are infusing young blood into the veins of our local and State societies.

While the State has been liberal in printing the State reports and in appropriations aiding exhibits of the horticultural products of the State, our horticultural representatives should continue to importune the Legislature for funds sufficient to maintain a distinctive horticultural department at the college in Lansing. Our societies have received much valuable aid from the faculty at Lansing by their unrequited labors in endeavoring to establish experimental forests, fields, and gardens for the purpose of testing the various trees, plants, and flowers, which may prove of value to our State. Experiments for these purposes should be inaugurated in localities possessing suitable soils and the best climatic influences, and should receive support from the State commensurate with the great interests involved in horticulture.

Observing farmers and fruit-growers are learning much regarding the habits of the great army of insects which prey upon every variety of farm and orchard product, but the aid of a scientific entomologist is indispensable in determining the habits and transformations of our insect enemies and their parasites, and in elucidating the mysteries of the destructive diseases which are supposed to emanate from fungi and bacteria which are so minute as to be invisible to the ordinary observer. We should have a State entomologist whose duties would not confine him to one locality. He should be "on the wing," and subject to the call of our State and local societies, or of individuals, in all parts of the State where his services might be required to meet and fight the enemy.

In these days of newspaper supremacy another paper might be considered superfluous. But in looking over the long list of journals published in the west we do not find one which is distinctively horticultural. The agricultural journals of the west devote pages to the "strain" of some animal monstrosity, and illustrate the mechanism of some wonderful implement, but the hungry horticulturist finds but few crumbs of comfort in the little corner which is devoted to horticulture. The crop reports in the great newspapers are manipulated to subserve the interests of the "bulls and bears" of trade, but the fruit-grower looks in vain for reliable reports regarding the condition of the fruit crop throughout the country.

The horticultural interests of the Eastern States and of the Ontario district in Canada, are well subserved by a few local journals. Michigan has, in the yearly report of the State horticultural society, the most useful and comprehensive report published in the country, but it only comes once a year and cannot be made of sufficient magnitude to contain all of the work done by the State and auxiliary societies. Could a weekly paper be established or adopted which should be conducted by the State agricultural and horticultural societies, and contain the full reports of farmers' institutes, local horticultural and agricultural societies, together with regular communications by a corps of paid correspondents throughout the State, our societies would have added much to the work done by organizations in the interests of horticulture and agriculture.

J. Brassington, Hart: I think the suggestion of Mr. Brown concerning a State Entomologist is an admirable one, and hope it will be followed up. Even if the State would provide an assistant to Prof. Cook, at the college, with headquarters there, whose special work should be injurious insects and their extermination, a great deal of good might be accomplished.

Mr. Smith, Benton Harbor: The study of entomology needs perseverance, industry, time, and thought. We need Prof. Cook, or some other man having his excellent qualifications, to go about the State and educate the people. The greatest damage is done to the horticulturist by the smallest insects and plant parasites. We are greatly in the dark, and of ourselves as fruit-growers have not the time or ability to trace out the causes of many disasters that accompany our endeavors. Every year, from some locality in the State, there arises a cry for help. I am wholly in sympathy with the suggestions of Mr. Brown's paper. I believe in organizations in the interests of fruit-growers. New things are developing constantly in connection with our work, and were this not the case, new men are continually joining our numbers, and may be saved the greatest disappointments by first learning the experience of those who have been longest in the field. One of the best things accomplished by societies is the bringing of inquirers and men of experience together. Asking questions is a freedom quite allowable in our country, and freely indulged in wherever we find a horticultural society, and often men who cannot or will not write a paper have a large fund of information that may be drawn on at will by intelligent and discreet querists.

President Lyon: Fifteen hundred millions of dollars are said to be wasted annually by insects. Horticulture is not alone interested in the control of these pests. Their ravages reach into every branch of life. Especially is agriculture, in its broadest definition, interested in knowledge of insects and methods of extermination. We ought all to unite in trying to secure not only the man who shall be an entomologist worthy of our State, but also the wherewithal to pay for his services.

Secretary Garfield: I want to recall attention to the suggestion made by Mr. Brown concerning horticultural literature. Here in Michigan we make the growing of fruit a great specialty. Statistics show an enormous production and export of horticultural products. Still the fruit-grower must depend on eastern journals for his newspaper published in the interests of horticulture. A paper with a good department devoted to Michigan horticulture would be a great help to us, but when we are almost wholly ignored by the newspapers, except when some enterprising grower places on the editor's table specimens of his first fruits, it is time we gave some thought to this item in the essay just read.

W. W. Tracy, Detroit: I heartily endorse the statement that there is a dearth of bright horticultural literature in our western papers. The departments conducted in the interest of horticulture are generally filled with dry matter often inappropriate to the season. We need something better and ought to have it. But are we not in blame ourselves very largely? The fruit-grower needs more than anything else the experience and judgment of other fruit-growers. Now if we all lent a hand in this matter and furnished some bits of information from time to time to the press, perhaps we would not find the fault we are now doing. While we are alive to our needs may we not ourselves do something to satisfy them, and perhaps in this way "grow" to a horticultural paper in Michigan.

Mr. Brown: Papers will not be supported unless somebody supports them. If our societies would furnish the local press with the results of their meetings it would help a great deal. But it would be a great thing for our western Michigan fruit-growers if they could take one paper that should from week to week contain an epitome of the work of all the horticultural organizations of the State. It would help us to decide upon methods of action as to marketing; and not only this, but give us items of information concerning insects and diseases invaluable to us. Every fruit grower could afford to take such a journal;—in truth could not afford to be without it.

Mr. Tracy: Paid contributions to newspapers are oftentimes simply "stuffing." What we want is the experience of practical men as it occurs, and an editor who can put it in good shape without impairing its accuracy. Here is where our society can do a great deal of good by contributing to a journal devoted in part or in whole to Michigan horticulture.

[At this juncture Mr. Mason, of Chicago, in answer to a question, stated that Michigan fruits in Chicago market as compared with southern fruits, stand high. This season at the time when southern strawberries were selling for $6 per case of 24 quarts, Michigan berries sold readily for $5 per case of 12 quarts. Organization of societies had a great deal to do with this. Superior fruit in better packages and finer shape was largely due to the education which fruit growers get by comparison of notes, observations, and experience.—SECRETARY.]

In continuation of the same subject Mr. T. S. Braman of Shelby, Oceana county, read the following essay:

The beneficial effects of constant intercourse with our fellow creatures is apparent. The great influence that learned societies have in forming a true national character is also a noticeable fact. It is a true theory that in union there is strength, and knowledge is power. No education deserves the name unless there is a development of thought. When minds meet minds and there is an interchange of ideas, then will intelligence increase in a noticeable degree. There is a rapid growth of the intellect.

May we not safely apply these principles to that branch of agricultural industry called horticulture? Man is gregarious by nature. To this fact he owes almost all that he knows, except to eat and to walk. Had not this been the case our farmers might still be rooting up the soil with a hooked stick, and our wonderful Oliver Chilled Plow would not be known. To this same fact man owes almost all he knows of the arts and sciences. There are many examples in the lives of men which illustrate the condition of man without association. The life of Casper Hauser, who only knew how to write what was supposed to be his name, and to repeat a single sentence taught him, illustrates my point. Man is imitative and inventive. His knowledge in this direction has taught him to build houses to shelter from the heat of summer and the cold blasts of winter; to construct and improve the plow, harrow, cultivator, mower and reaper, thresher, and all of the varied useful implements designed to assist the farmer in a thorough and more rapid culture of the soil.

There are a few, however, who dare not take advantage of these useful means, who will not step outside of the old beaten paths of their predecessors, but will still hold fast to the superstitious notion of "planting their beans in the moon." Whoever dare go beyond the old beaten track, however, is sure to have a score of followers, some to criticise, others to admire and follow in their footsteps. These are the men who march on to enterprise and improvement. The men who do not meet and associate with their fellows are little else than hermits and misers. Let two farmers, or fruit-growers, meet and converse upon the various methods of farm husbandry, or upon the proper culture and management of an orchard, exchanging views and experiences upon the same topics, and who will deny that something can be learned that will be of great advantage to them.

How much more, then, can be learned from a society like this, composed of intelligent and experienced fruit-growers, representing as they do the different sections of our fruit growing State. It is here that we may learn of the success and failures of our large fruit-growers, and profit by their experience. We can discuss the scientific branches connected with pomology and horticulture (climatology, entomology, and vegetable physiology), all of which rightly understood, will aid the horticulturist very materially.

Societies have done much in the past to educate fruit-growers in regard to the best manner of exterminating the numerous insect pests that are such enemies to them. To societies we are indebted for what is known in regard to the dread disease that infects the peach, known as the yellows. To societies we are also indebted for the origin of our present yellows law enacted by our State Legislature, a petition for the same having been presented to that honorable body by a committee appointed from our State Horticultural Society, the members of which had come to the conclusion that legal measures must be taken in order to stop this spreading of the disease, which it seemed was determined to destroy all the trees then growing in Van Buren and Allegan counties, as it had in Berrien county. This is one of the many benefits growing out of an organization of this kind. We, as fruit-growers of this State, should feel grateful for this act alone, and see that wherever there is a necessity it is put in force.

Organization has done much to aid the fruit-grower to a more safe and cheap transportation of his fruits to a ready market, and there is no doubt that much more will be accomplished in this direction. No single shipper can get rates that can be obtained by a committee representing a society of fruit culturists. Much credit is due our State society for the efforts made, and still making in that direction.

Were it not for our State society and its branches there would not be such fine displays of fruits at our State fairs, which are such a benefit to our State as well as to fruit-growers in general, for it is there that the different varieties are exhibited grown in the various sections of the State, and by this means we are enabled to judge of the merits of fruit grown in the various localities, and it serves as an advertising medium also. To our State Horticultural Society we are greatly indebted for the annual reports which contain so much valuable instruction to the fruit-grower, that are gotten up at so much expense of time and money, and are a library in themselves. It is easy to discern the difference between the present state of our horticultural developments in this State and that of 41 years ago, when the first society of the kind was organized at Detroit. We have more and better varieties of all kinds of fruits adapted to our climate. In the year 1841 the first New York State fair was held at Syracuse. We had very few horticultural exhibitions at that time, except at State fairs, and there were no large exhibits. Then the man who took the first prize carried his exhibit from the cars in a willow basket, which contained his entire collection. Quite a difference from the large show made at the American Pomological Exhibition, held at Boston in 1872, and our Centennial Exhibition at Philadelphia, where the collections were so large that it was impossible to accommodate the whole. And yet, with all this increase, good fruit sells for a higher average price in market than it did 40 years ago, when there was not one hundredth part as much raised as at the present time. From these facts and figures I think it is plain to be seen that association has done, and is capable of doing much for horticulture.

A rambling discussion followed Mr. Braman's paper, an epitome of which may perhaps be gathered under the title

GROWING FRUITS IN A NEW COUNTRY.

S. A. Browne, Pentwater: I am satisfied in a new country we do not live up to our possibilities in horticulture. In working to build up a home, oftentimes men forget that it costs nothing to grow a few trees, bushes, and plants, but wait until a good piece of land is cleared and stumped before any effort is made in this direction. Again our people, I sometimes think, are not alive to the advantages of our country for the growing of fruit, but I can say to the gentlemen with us to-day that Oceana county has been making rapid strides in horticulture the past decade. It may not appear to you in this way who have never seen this county before. We know we have many things to learn, and we are right glad to have you come among us and let us ask you questions.

C. N. Merriman, Whitehall: I have never seen more satisfactory results of labor in horticulture than I have witnessed the past few years in this northern lake shore country. We have advantages and I want to see them developed. I not only desire to see specialists in horticulture employ their means and ability in opening up our native resources, but I want every farmer to live up to his possibilities in having about his home such fruits as succeed admirably in our new country.

J. H. Sammons, Sammons' Landing: I want to call to mind again that matter of a State entomologist. We want him and we want him without much delay. There was a time when people talked as if in this northern country we should be free from the curculio, codling moth, and a thousand other insects that annoy the growers of fruits. But Providence has not arranged for us to be so isolated, that these insects would lose their way in getting here. Their name is legion now, and in many cases they are too much for us. We don't know enough about them and the best methods of their destruction. When a new enemy comes upon us so small that we do not recognize his existence except by his ravages, it would be a great help if there was some one we could cry to and have him come to us and lend a hand in circumventing the enemy. So I say give us a State entomologist who shall be "our man." We will do him great honor by soon allowing him to feel that he is a public benefactor. I have been troubled with the falling of the peach and plum leaves. It is rather new to me and I would like information.

Mr. Lyon: I judge the peach tree curl-leaf has done a good deal of damage with you, and may be the cause of leaf-dropping in the peach. This difficulty is of fungoid origin and varies in amount in different years. The premature falling of plum foliage has occurred under so many conditions that we can hardly say as yet that it has a uniform cause. Many upon the southern lake shore think that overbearing of fruit decreases the vitality of the tree and causes the defoliation. Others attribute it to peculiarities of the season. My impression is that anything which will impair the vitality of the tree will tend at least to aggravate the difficulty.

Mr. Merriman: I have known peach curl since my boyhood but have seen no very disastrous results. New foliage rapidly takes the place of that injured and it is for only a short time that the trees seem to suffer from this disease, and it rarely affects the fruit. I opine that the prevalence of it this season is due to the peculiar weather in May and early June.

G. C. McClatchie, Ludington: Peach curl we have had, but no especial damage has been done by it; but not so with plum leaf difficulty. I have known after a muggy time in July plum trees to be entirely defoliated, which prevented the ripening of the fruit and consequently resulted in great loss to the grower; and not only this for the year, but the trees, as a result, seemed greatly impaired in vital force.

D. L. Garver, Hart: When we started in fruit culture in this county we had no curculio, but we knew nothing of varieties adapted to this climate. This knowledge had to come from experience here. As a consequence a great many trees have proved worthless and a great deal of regrafting has been made necessary. Those who engage now in fruit growing have the benefit of this experience and can be more certain of their results.

Mr. Sammons: The question of best methods of procedure in a new country depends almost entirely upon a man's capital. Most of our people have started with little beyond their hands, and hence in a majority of cases fruit trees are planted out before the ground is fitted for them; still I argue that it is better to set the trees quickly, even if every stump is not out. A man who has capital and can go right on and clear a place thoroughly for orchard planting had best do it. But my advice to every man is in a new country have fruit growing on your place as soon as ever you can.

S. A. Browne: We are laboring under the difficulties which attend a scarcity of means in this country. There are to-day 2,500 acres of waste land that if improved would make the best fruit sites in this county. The land can be bought for from three to five dollars per acre; but the difficulties have only just begun when the land is once purchased. It will cost from ten to twelve dollars more to clear each acre, and from ten to eighteen more to stump it. This, put at the maximum, however, does not bring our best land very high. Thirty-five dollars per acre for nicely cleared farming land is not very extravagant. We have an excellent locality for most kinds of fruit. As yet the ravages of insects are not so great as in the older parts of the State, and fruit brings remunerative prices. There have been more orchards planted this season than ever before in the same length of time.

Wm. A. Brown: In our ride to Hart, which the citizens so kindly gave us, we certainly found as fine farming land and as nicely cleared farms with orchards as one could ask for. The soil seemed good and the farmers thrifty.

W. W. Tracy: Prof. Sheldon says that the prevailing agricultural practice of any country is generally the best on the whole for that country. I am not certain but that this is true of horticulture. We are apt to criticise the methods of other places than our own; but progress in a new country must be very slow. The fact is the methods for that country must be based upon its own experience. A man going from Western New York into Northern Michigan, and relying entirely upon his past experience to guide in his practice, will fail as sure as the world. In the selection of varieties this is peculiarly true. It is an easy thing for any one going into a new place to take specimen trees of a number of varieties and watch their suitableness, but too few do it. They generally take nothing, and when the tree agent comes around take his judgment, which is utterly worthless; even lose the labels of the trees, if they are true to name, and years that might bring a profitable experience are entirely wasted.

President Lyon: I would like to draw out the experiences of this locality as to a few leading varieties that do well here, and are good for family use.

Mr. McClatchie: In strawberries I would name the Wilson; in currants, Red Dutch; red raspberries, the Philadelphia; in plums, the Green Gage, on peach stocks. I have raised a bushel on a tree the fourth year from the first by pursuing this method. In grapes, Concord and Delaware.

E. J. Shirts, Shelby: I would set Green Gage for home use but Lombard for market. In strawberries I should certainly prefer the variety you have done me the honor of giving my name; in apples, the Red Astrachan and Waggener; in cherries, Early Richmond. One gentleman would plant the Bradshaw in preference to any other variety of plum, but feared that plum culture would find a harsh enemy in the rot.

Mr. McClatchie: I agree with the gentleman that we have much to fear from this disease; however, I do not believe it contagious. My experience is that after trees have borne heavy crops they are more subject to it. I have watched the matter some time now and have observed that young trees loaded with fruit, standing close beside older ones upon which the fruit was rendered worthless by rot, were not effected in the least degree.

Evening Session.

The question box commanded the attention of the convention for a little time at the opening of the evening session.

No. 1. To thin the crop on a peach tree, would it be advisable to cut back the ends of the branches after the fruit has formed?

Mr. J. J. Atherly, of South Haven, said that the only method of thinning peaches by the best growers was to pluck the fruit as early as possible after it was settled what the promise for a crop was. He thought the only difficulty lay in getting growers to thin enough in a season of fruitfulness.

No. 2. Is there any strawberry that is enough earlier than the Wilson to make it any object to raise on account of its earliness?

W. A. Brown: Generally speaking, no; for in all markets of any capacity the berries from the south come in and compete with anything earlier than the Wilson, and really there is no profitable berry much earlier than the Wilson. This might be modified for some locality where an early variety does especially well and no foreign berries are shipped in.

No. 3. Is there any danger of having the soil for a peach orchard too fertile?

C. A. Sessions: I am satisfied that heavily manured land will render the peach half hardy in our climate.

Mr. Tracy: I do not believe earth can be made too rich for the peach if a perfect fertilizer for the crop is employed. The trouble lies in getting in our crude way the proper constituents in the manure for the purpose intended.

Mr. McClatchie: Our severe winters must be looked after. There may be a symmetrical growth of tree, a proper formation of fruit buds and all that, and still under the stimulus of a very rich soil the growth will not be fitted for winter before winter comes.

W. A. Brown: Much depends upon the character of September. It is the climate of that month that does more to make spongy growth than manures.

The first essay of the evening was given by Mr. A. J. Garver, of Hart, on

MARKETING FRUIT.

In consenting to write an article for this meeting I did so feeling quite confident that I could handle fruit to much more advantage than I can this subject, for I flatter myself on being able to plunge a good, spicy apple, or a rich, delicious peach, into an "internal abyss" with as much ease and in as short a time as "the oldest inhabitant." My article, owing to want of time, will be short, and for want of ability will be of little consequence.

The subject of marketing fruit is one of vast importance to the man who would make fruit raising a financial success and gain a reputation for furnishing "the best the market affords" for the fruit trade, and one that deserves much more attention than is usually given it.

I think if the fruit-growers of this county would make the most of the natural advantages which God has given this section by which they can gain a competence in one of the most pleasant modes of tilling the soil, they should, as soon as possible, form an association through which they can get their crop to market in the shortest possible time and in good condition. I think an association should be formed, because it is to every man's interest that his neighbor's fruit should go into market looking as sound and fresh as his own, and thereby build up a reputation and a call for the fruit from this locality, and this can best be done by all working together for the good of the whole.

To get fruit to market looking fresh and in that fine state of preservation in which it should be, in shipping by rail, cars should be procured which have been built for that express purpose, and well arranged to keep the baskets from being jostled together, thereby bruising the fruit more or less; and in every car should be stored a sufficient amount of ice to keep the car cool and at a standing temperature, and the car should also be kept as dark as possible. It is remarkable how fruit will keep in a dark, cool place, where the temperature is at a stand-still, though it be very ripe.

Having secured good shipping facilities the next thing of importance,—and it is the most important part of fruit-raising—is the picking. I have seen men picking peaches when it tried one's patience to the extreme to see the careless manner in which they would toss them about. In picking peaches or plums one should handle them with as much care as he would eggs. Pick them carefully,—never pinch them,—and lay them gently in the basket without dropping them an inch, as wherever the fruit is bruised in the least there it will commence to rot, and that will not only injure the peach or plum commencing to decay, but all that lie close to it. Always when possible pick in the same basket in which the fruit is to be shipped, as it saves one handling and the chances of bruising and marring which attend the handling. The habit some have of pinching or feeling of a peach to see if it is ripe is worse than carelessness, and the man who cannot tell by the looks of a peach whether it is ripe enough to pick without pinching it, does not know enough to pick fruit and should never be employed.

Apples, peaches, plums, etc., should always be sorted; never put the large and small ones in the same basket. The small ones while not helping to fill the basket spoil the looks of the whole, while if sorted they will measure more and the small ones will pass for as good a lot of peaches as the whole mixed together, and the large ones will sell for extra fine fruit.

It is of the utmost importance that fruit should reach the consumers in the shortest time possible after being picked, and I think if an association of the fruit-growers of this county be properly organized, the fruit from this section can be shipped direct to the consumers and retail dealers in Illinois, Wisconsin, and Minnesota, thereby saving the time and expense incurred through the commission merchants of Chicago and Milwaukee, as well as the marring of the fruit in consequence of the extra handling which is incurred at their hands.

In conclusion I would say to the fruit growers of Oceana county, organize.

Organize thoroughly, handle your own fruit, and then you will know it is done carefully. Do your own selling and I assure you you will be well paid for your time and trouble by the increased returns which you will receive for your fruit.

The next essay was by Mr. James Brassington, of Oceana county, upon the subject of

OUR SOILS.

"Not what I have, but what I do is my kingdom."

It is within the last centuries of the world's history that men have gathered seeds and stored up a little of the last year's crop for future use. The savage knew nothing of agriculture. He lived by killing wild animals with stones or clubs. But as we follow step by step down through the ages of his progress and civilization we learn that at first he burns out a hollow log. He launches it for a boat to fish in. Soon the parts are lashed together with thongs of bark. Next the planks are fastened with nails, and finally culminates in the beautiful steamers and vessels that traverse our rivers, lakes, and oceans. And thus the world was opened for colonization and civilization. Soon minerals were discovered, heat was applied, and the minerals were smelted into metals. Then man made unmeasurable strides. Then he could make tools, chisel stone, build houses, and proceed by his unwearying industry to devise manifold means and agencies of civilization. In this way men have continued to work, reclaiming the soil, fitting and improving it so that it would abundantly grow all the crops necessary to supply his wants.

As the population of the world increased it evidently became necessary to till the ground. The more rapidly the population increased the more thoroughly had this tillage to be performed. In China with her hundred millions it has been the practice for centuries to till and manure the soil with the greatest care and economy. Nothing is wasted; everything is saved and put to some profitable use. Yea, every weed that is pulled up is buried in the soil in order that by its decomposition it may make manure for the growing plants to feed upon.

There is a well known story of an old farmer having called his three idle sons around his deathbed to impart to them an important secret. "My sons," said he, "a great treasure lies hidden in the estate which I am about to leave you." As the old man was about to gasp his last the sons exclaimed in a breath, "Where is it?" "I am about to tell you," said the father. "You will have to dig for it ——," but he died before he imparted the weighty secret. The sons with great energy set to work with spade and plow on the neglected fields, to turn up every sod and clod upon the estate. They were unable to find the hidden treasure, but the fields were sown, the harvest came, lo! the yield was prodigious in consequence of the thorough tillage of the soil. Then it was that they discovered the treasure concealed in the estate of which their wise old father had advised them.

Generally soils are much like an individual character. They are made good according to the amount of thorough cultivation bestowed upon them. In no occupation do we receive a greater benefit than we do from the judicious management of our soils. Without it nothing can be expected. If we would make our lands pay we must work them with the utmost care. The wise physician wishing to restore an exhausted constitution tries to stimulate the system of his patient by feeding nourishments. Step by step his patient gains strength, and by this accumulative process he is restored to health, made new again, and ready to enter into the active and vigorous work of life. This successful practice of the physician is a golden rule of a practical agriculturist. By a system identical the poorest soils by his hand are restored and made exceedingly productive. Every spear of grass or weed that grows on the soil stimulates and enriches the ground, preparing it for crops of greater utility. In the densely populated countries of Europe this of necessity has been practiced to the highest degree, and the thorough cultivation of the soil has taken deep root in the heart of every husbandman.

Perhaps I can entertain you for a moment by giving an outline of the industrious habits of the Belgians. Though far behind the average English farmer in knowledge and intelligence, yet they surpass him in their frugality and practical knowledge in agriculture.

The soil was originally the poorest in all Europe. Many of the large provinces that once were great sand plains are now, as far as the eye can see, a perfect field of vegetation, all of which is the result of an indefatigable care and labor bestowed upon the cultivation of the soil, for in its natural condition it consisted wholly of barrens, and its present degree of fertility is entirely owing to the skillful management and judicious application of various manures. It seems as though the Flemish farmer needed nothing but a space of ground to work upon; whatever be the quality or texture of the soil, in time he will make it produce a good crop. These white sands are like the drifting sands of our seashore. Nothing can be more interesting than to follow step by step the progress of improvement. Here you see a cottage and cow shed built on the most unpromising spot on earth. The white sand blown into mounds is only kept together by the roots of a few scanty shrubs. At first a small spot is leveled and surrounded by a ditch that a part is sown to broom, some of it planted with potatoes, and perhaps a small patch of diminutive clover may show itself. Manures, both liquid and solid, are collected, and this forms the nucleus in a few years to become a little farm. If they have no manure the only thing that can be sown at first on the pure white sand is broom; this will grow on the most barren soils. In three years this can be taken off and sold to the baker or brickmaker for fuel. In this way a little money is realized from the first crop, and usually it is expended in purchasing manure to be put back on the land. Yet this is not the only profit. The leaves that have fallen, and the roots and fibres have enriched and rendered the soil more compact, so that the blowing winds do not drift it as much as before. It can now be plowed and sown to buckwheat, or even rye, at this stage, without any manure.

After these crops are harvested a regular course of cropping begins. As soon as sufficient crops can be raised to keep a cow then the improvement goes on very rapidly. In a few years the soil has undergone a very remarkable change. Instead of the shifting sands we have a mellow and retentive soil, which will hold moisture sufficient for the nourishment of the plant. Thus having been enriched by the decomposition of the roots and leaves it may now be sown to clover. This miserable, poor land has been reclaimed, and now no one could tell the difference between the productiveness of these soils that were in a state of nature worth nothing, and those which were originally good. All this has been accomplished by the untiring hand of the laborer. To me this is positive proof that all our sandy lands which are, comparatively speaking, good compared with those of Belgium—yea, all lands that we see can be made into good farms. All that is needed is patient and judicious management. To a stranger while on an excursion, Michigan may not have any distinguishing peculiarities except her dense forest trees, both deciduous and evergreen, yet these would show to an observing mind the richness and adaptability of our soils. The thousands of bushels of fruit of different kinds that pass from our shore add proof of the fertility of our lands.

The constituents of these soils vary greatly. Frequently within a few feet this variation becomes manifest by the changes in the growth of the timber and vegetation. In accordance with the theory that particular kinds and varieties of fruit require for their successful cultivation different soils, this then would be an advantage. Some kinds requiring heavy, and others light soils, some varieties require dry, while others do better on damp, cold soils. For this reason we can say that nature has admirably arranged them. For here the fruit-grower may raise a variety of fruits that ripen at different periods, thus enabling him to distribute his labor and realize the profits of different markets. This diversity of soils is peculiar to our state, and more especially to the fruit belt, for in no part of the country do we find the surface so diversified. It is not uncommon to find one portion clay loam, another portion sandy loam, while some may be nearly all sand.

These combinations and variations constitute a soil unsurpassed for fruit-growing. Nearly all the fruit that can be grown in a temperate climate seems to find a home in our peninsula. This fact alone would prove very conclusively to any fruit-grower that our lands are preëminently adapted to successful fruit-raising.

Agricultural chemistry teaches us that the fertility of soils depends largely upon the relative ingredients of the soil; that is, all the elements necessary to plant growth, such as potash, soda, lime, magnesia, which are generally called alkalies; the acids of sulphur, phosphorus, and silex, or our common sand; and the neutrals, such as chlorine, oxide of iron, and oxide of manganese. These are the earthy matters, but the greater part of the food of the plant is taken from the carbonic acid of the atmosphere.

Indeed, we have more than this. The surface is covered to a great depth with earth, scientifically called drift, a mass of earth that has been formed by the breaking up and grinding together of rocky masses (during glacial period) until they have become pulverized and mingled together into a more or less homogeneous mass of sand, clay, and gravel, mixed in with shells consisting of carbonate of lime. It is from the latter that the lime of our soils originated.

As we travel along the lake shore, we find many places where the sands, even on the steep hill-sides, are so porous that the heavy rain-falls do not wash or gulley the surface. On these steep banks can be found large maples mixed in with many other trees and shrubs. This most certainly indicates that there is something very remarkable about these light soils along the lakes and for many miles in the interior. Plums and such fruit that do not do well on sandy soils in other sections, have never failed to give a prodigious yield with us. This fertility is largely owing to the permeability of the soil. To be permeable is to be porous.

In coarse gravel and sand the water runs through them very rapidly, carrying a large part of nutriment of the soil with it, and as a natural result it renders the land worthless, for the plant is unable to find sufficient food to sustain it in the growth.

Generally the soils in this vicinity are finely divided, more of an alluvial deposit than of an ordinary soil. For millions of years this lake formation, which is indeed very similar to what takes place in great river basins, has been by the constant action of the waters of Lake Michigan, deposited and drifted into the many hills, valleys, and ravine of the land before us.

An examination of our soils would show them to consist of very fine texture, and in consequence a high degree of permeability. Place some soil in a glass vessel containing water, and then shake it, afterwards allow it to stand, we will see a good deal of mud floating and settling upon the coarser particles. This sediment is mostly composed of clay, which in certain proportions adds greatly to the fertility of the soil.

Can we make good farms and orchards out of these light soils? The splendid and prodigious yield of vegetables that has been grown on the lightest sands in the village, the large and thrifty orchards that are now growing on sands that at first seemed to be worthless, are, though silent, yet the truest answer of this question.

The exceeding high prices that have prevailed in Western Michigan, more in the vicinity of South Haven, have led people to believe that it requires a large capital to begin in the fruit business. This only proves that the profits are very large, especially when the orchard has been thoroughly and successfully cultivated.

The fruit region is extensive, and in consequence the extravagant prices paid for land in a few localities have not extended to whole regions. Thousands of acres of as good fruit land as ever was sold can be found in this vicinity, and the price seldom exceeds $10 per acre.

Any man with but little capital, but having a determination and willingness to work, can safely engage in this profitable business. With judicious management he will in a few years have a productive and thrifty orchard surrounding his home. These are a few of the inducements we offer to you.

The treasure is concealed in these soils about us. Every clod and sod must be turned. The mind must direct and the muscles must act; but remember that while we take from the soil we must give in return. Upon this hinge swings failure or success.

Some one asked if it was not practicable to do something with commercial fertilizers in our country.

Mr. Brassington: After giving quite a bit of attention to the experiments with commercial fertilizers I do not hesitate to say that for our country they are a snare.

Mr. Pearsall, Grand Rapids: I have often noticed that the best hills of corn grew next to stumps, and have wondered whether in the decay of the stumps there might not be a manure added to the soil.

Mr. Jones, Benton Harbor: Take the stumps out and you will be the gainer every time. You will grow gray in a delusion if you ever expect fertility to come from a decaying stump.

PEAR BLIGHT AND CURCULIO.

The question box was called up again and a discussion ensued upon the following queries:

No. 6. Pear blight is appearing in the north of our State. What can we do?

S. G. Antisdale, Benton Harbor: As soon as it appears in a tree cut it out below the apparent injury and keep doing this. I am satisfied from all we know of this disease and all the experiments that have been tried that nothing has proved a better remedy.

E. H. Scott, Ann Arbor: This is my experience. I would not wait to see how far the disease might go in the tree, but cut off the part affected some distance below the diseased part at once, upon observing it.

Secretary Garfield: I know that so many remedies have been suggested and so many nostrums recommended as "sovereign remedies" for blight that a gathering of fruit-growers like this will always laugh at any suggestion as to a remedy, still it is not best for us to entirely ignore the experience of others, although we should not swallow their conclusions. Very many believe that when the wounds are made by cutting off the diseased wood that crude carbolic acid or copperas water will have a tendency to disinfect (if you will allow the term), the diseased wood, if any remains, and there will be less liability to a spread of the disease from this point. When we know as little of the cause of any difficulty as we do of pear blight, we have no right to laugh at anybody's remedy, for we cannot say but that it may be even a scientific one.

Mr. Brassington: Are pear blight and peach yellows similar?

Mr. Lyon: Prof. Burrill traces the two diseases to a uniform cause, although we are not far enough along in the investigation of the diseases to even accept this idea as finally proved.

No. 7. Why shake trees for curculio in the morning as recommended by the books when the insects are doing their work only in the warm parts of the day?

Mr. McClatchie: To be sure the curculio must have it warm enough so he is not numb in order to pursue the object of his life, still in the days of early summer he can get at business very early in the morning. This past season however we have had remarkably cool nights and are still having them, so the curculio remains quiet until the sun is well up. Warm mornings it is best to be at the business of catching pretty early, while in cool days the best success is had in the middle of the day. Some judgment is required even in so small a matter as this.

W. A. Brown: In cool weather the Ransom chip process may supplement the sheet in catching the "little Turks."

Mr. McClatchie: I am peculiarly situated. My plum orchard is entirely isolated from all other plum orchards, and hence my plan of catching curculio, although not generally applicable, serves me well. When it is time to gather the annual crop of curculio I do the whole business at a single job. That is, I go over my entire orchard some morning and shake off all I can get, following this immediately by another round and this by a third, until I get none in the sheet. Then I have no further trouble that year. Of course I understand that this plan will not answer except in a case like my own where no other orchards are near at hand.

Mr Smith, Benton Harbor: I have found it necessary to use a wet sheet in the middle of the day. All understand that the reason for doing the work early in the morning is to take the insects when they can not fly readily. But if a wet sheet be employed, even in the hottest day they may be gathered without trouble. While on my feet I wish to make the observation that the curculio are in many cases a blessing, for unless their work is done numbers of trees are overloaded and ruined. People will shake off the curculio, then allow every plum to hang on, the leaves will fall off and the fruit never ripen. Then these same fellows will come up to meetings of our society and inquire what is the cause of premature falling of the leaf, and what to do that their plums may ripen. I stand here a champion for the curculio. He is a blessing in disguise. He often exercises a great deal more common-sense than the biped who seeks his destruction.

Meeting now adjourned until morning.

Wednesday Morning Session.

The first topic of the morning was the question of

TRANSPORTATION OF FRUIT.

The secretary remarked that in the announcement of the June meeting it was said that the matter of shipping fruit would be a topic of discussion; that in conversation with Mr. Nichols, of the Chicago & West Michigan railway, he had learned that it would please that company to make some arrangement by which its shippers in Western Michigan could ship by carload at very much reduced rates. This was the system practiced by shippers in Central Illinois, and it had given very general satisfaction.

From a circular issued by the Illinois Central Railway he learned the following to be some of the points required by the company:

1. A car load is 16,000 pounds or less.
2. Consignor attends to loading of cars.
3. Railroad Company sees that correct weights are given, cars properly locked and sealed and billed to persons designated by shipper.

By adopting this method of shipment the owner looks after his own fruit, and if there is carelessness in handling it is his own fault.

The Secretary read the following telegram from Superintendent Nichols:

"I regret very much that on account of my assistant having been unexpectedly summoned to Chicago as a witness I cannot leave home. I hope to hear that the Illinois car-load system is discussed. If in event of anything being done we will reduce the rates twenty-five per cent for full car loads below our present rate on small fruits to give the matter a trial. This reduction may be not enough or too much, but we could try it and then change if necessary."

The Secretary said it was not advisable for our society to take action as a society in this matter, but the gathering of fruit-growers here rendered the discussion of the topic desirable.

Several gentlemen spoke of the desirability of some cheaper method of shipment than express and more speedy than ordinary freight, and wished that some arrangement could be entered into by which a fast freight train could be utilized during the soft fruit season.

Mr. Hubbell of Benzonia asked what advantage there was in rail shipment when Lake Michigan bordered your orchard?

H. H. Holt, Muskegon: We have a choice at our place, and fruit-growers are divided in their opinions. Some prefer the water, others the railway; but I am satisfied that in united action better rates and accommodations can be secured than are accorded to fruit-growers at present, and I would like to see some action looking toward this end taken at this meeting.

W. A. Brown: Local societies must do this. We have settled the question in Berrien county and have such arrangements as we desire. Railway companies will yield points as soon as they see there is plenty of fruit to ship, but you cannot expect extraordinary rates until you can at least fill a car per day from one point. It is the amount of freight that reduces the rates and compels good arrangements. As you have more shipping to do unite together in your local society and decide upon what will be good, fair treatment, and you will get it.

On motion the following committee was appointed to take in hand the transportation question and report before the close of the meeting: H. H. Holt, Muskegon; J. H. Sammons, Oceana; Wm. A. Brown, Berrien.

Mr. J. H. Sammons, of Sammons' Landing, read a short paper upon

THE INFLUENCE OF WATER ON OUR CLIMATE.

For the past thirteen years I have watched the influence of Lake Michigan on our climate. My orchard is at the extreme point of Little Point Au Sable, and running down to within three hundred feet of the water. Its elevation is about sixty feet above the level of the lake. In the past thirteen years the cold has not injured my fruit.

Through the summer months the mercury ranges between 70° and 85°, while in the winter it seldom goes below zero. The winter of 1875 was an extremely cold one; the cold wave swept down over nearly all the western States; the peach buds were nearly all killed, and the wood of that season's growth as well. At my place the thermometer indicated 14° below zero, while farther east, or back from the lake ten miles, the mercury went as low as 20°, and in some places 30° below zero. During the season of 1875 my trees that were old enough bore very heavily. From thirteen Hale's Early I sold one hundred and nineteen dollars worth, and fifty dollars worth from four trees of Early Crawford.

In thirteen years the mercury has only dropped below zero as follows: in 1873, 10° below; in 1875, 14° below. The balance of the time the mercury has kept near zero; seldom below during the coldest weather.

My correspondence with persons residing in Kenosha, Wisconsin, has kept me posted as to the extreme cold weather there, and my observation has been that often when the mercury is at zero with us, it is 20° below at Kenosha. Kenosha is about 70 miles south and 60 miles west of us, therefore the influence of the water on our climate is easily seen, when we take into consideration that the prevailing winds are from the west and southwest, giving to the land along the east shore a warmer climate and a more equable temperature than that farther inland, while on the other side of the lake the wind is from off the land, so that the water does not affect the temperature to any great extent.

I find when the water is frozen over a distance of two or three miles from the shore, that it affects the temperature to the extent of several degrees, causing it to lower. This is caused by the wind blowing over the ice, but the water seldom freezes over to any extent from the shore.

Oceana County is bounded on the west and northwest by Lake Michigan, and the dry, piercing winds from these directions come to us moist and almost balmy. This lake is an immense body of water, hundreds of miles long, and about a hundred miles wide, and from a hundred and fifty to a thousand feet deep, and the influence of its waters is wonderful and highly beneficial, hence it is that Oceana County, laying between 43° and 44° north latitude, ranks as a first-class fruit-producing county. The sandy lands of the western shore of our State are found to be best adapted to peach culture, and both land and water are here combined to produce in rare excellence this delicious fruit. The close proximity of Kenosha, Racine, Milwaukee, Sheboygan, and Manitowoc affords us good and convenient markets. I confess I am somewhat prejudiced in favor of Oceana as a fruit-growing county, especially the lake shore. This county, like Huron, is almost surrounded by water, as it extends into Lake Michigan. Our Lake Michigan is a larger body of water than those which temper the climate of Huron County. In no part of the world, perhaps, is the warm influence of a large body of fresh water more distinctly marked than in Oceana County.

Our county lies north of the 43d parallel. We are north of Omaha, Des Moines, Toledo, Cleveland, and New York, and a parallel line running east and west through our county would go through Canada, New York, Vermont, and New Hampshire, through Wisconsin, Minnesota, Dakota, Wyoming, Idaho, and Oregon; notwithstanding all this we stand in the front rank of fruit-growing counties of our age. But a satisfactory explanation is found in our geographical position, which is as unique as our productions are remarkable. This brief and somewhat hasty review of the influence of water on our climate is sufficient to show the wonderful capacity of our county for growing fruit, and it can be grown here with the least possible care, while the people of less favored regions have to prepare, if not make a soil, provide a shelter, and labor, and wait for a scanty crop of small and inferior peaches. The citizens of our highly favored land have thousands of acres of suitable soil, where the trees grow luxuriantly and bear bountifully in a few years, almost without care, and without any shelter.

In conclusion, already a thousand cattle feed on our hills. Milk, honey, wool, lumber, wheat, rye, oats, peaches, plums, and grapes, we produce in abundance, all free to enjoy and no one to make us afraid.

Mr. Holt: A glance at the map of Michigan will verify Mr. Sammons's statements about the peculiar situation of Oceana county. Point Au Sable, upon which Mr Sammons's fruit farm lies, the width of two towns farther into Lake Michigan than Muskegon, and the land retreats rapidly toward the east upon going north or south from the point, so that winds coming from almost any direction except east must cross a body of water before trespassing upon Mr. Sammons's premises.

Mr. Atherly: I was about to inquire of the gentleman how he saved his peaches from a cold east wave. We at South Haven have enough water except to the east of us, but I can hardly see how, even in Oceana, peaches can escape when the thermometer is dropping to all along below zero with a chilling blast from over northern New England which has only been turned a little in its course from ice-bound Labrador.

Mr. Sammons: We have some high hills to the east of us and those cold winds shoot over. But most of the winds to be feared come from southwest, west, and northwest, and from these we feel secure.

Mr. Holt: You must not forget that our great country reaches up to Alaska where the entire business is breeding cold weather, and winds starting out in our direction from up there would come across the narrow part of the lake for you. I don't see but that in spite of your providential position that it would be policy to petition that the Alaska people blow easy.

W. A. Brown: Just so, and at the same time, if they persist in blowing hard, old Berrien has the advantage, for nearly all of Lake Michigan would be then brought into play for our especial benefit.

Mr. Lyon: In all this talk about influence of water on climate do not think you can be safe in warm (?) valleys by the lake. Elevation should in all discussions of this kind be taken into consideration.

Mr. Smith, of Berrien: I understand that Mr. Parmerlee started peaches in the Grand Traverse region, arguing that it was as salubrious a climate there as in St. Jo, but a few hard winters demonstrated the faultiness of his theory.

Mr. Hubbell: Gentlemen, say what you please, we do raise peaches of excellent quality in the Grand Traverse region; and despite what has been said concerning Mr. Parmerlee's venture in Benzie county, we can raise peaches as a commercial enterprise and succeed admirable if you will only keep your yellows away from us.

Mr. Tracy: I was quite familiar with Mr. Parmerlee's peach orchard that was ruined by the cold winter, but claim that had that same orchard been located any where along our lake shore that winter disaster would have overtaken it. No peach orchard that makes an annual growth of four or five feet and continues growing until winter sets in can withstand a degree of cold that very often is experienced along the whole length of our shore, and this peach orchard of Mr. Parmerlee's went into winter in this shape and of course was ruined.

Mr. Heath, of Muskegon, explained how he had succeeded in Oakland county in hardening peach trees by periodical pinching in August and September, so that an orchard there had borne crops for over twenty years, having come through all the hard winters in good shape.

Following this discussion, President Lyon being called out, read the following paper on

WILD FRUITS AND THEIR IMPROVEMENT.

In considering this subject we may at the outset remark that the peculiarities of our climate, growing out of our semi-insular situation, have doubtless had very much to do with the original enforesting of the State, and that the forest growths through their sheltering influence have, in their turn, supplied the conditions requisite to the success, not to say the existence even, of many of our indigenous wild fruits.

We may add, also that our climate, so far as humidity and extremes of temperature are concerned, is so modified as to become the equivalent for several degrees of additional latitude southward, adapting our State to the production of many of the products of Central Kentucky and northward. Owing to these favoring circumstances and the great length of the State from north to south, the number of our indigenous wild fruits is found to be very large, while the modifications of many of them consequent upon the varied influences of climate and soils, operating through indefinite periods in the past, have in many instances provided the best possible material to which to apply effectively the more modern processes of scientific amelioration.

To apply such process in the case of a wild fruit possessing the fixity of character of our native crab apple (*pyrus coronaria*), for instance, can offer little prospect of desirable results in the near future unless, perchance, some not too remote member of its family can be brought to hybridize with it. On the other hand a fruit which, like the blackberry (*rubus villosus*), or the black cap (*R. occidentalis*), indulges spontaneously in its wild condition in variations or sports, becomes hopeful subjects for the application of the process, whether of hybridization or otherwise, by means of which nature operates in the work of amelioration.

In the study of our native fruits with reference to such purpose, we will no doubt discover yet another and a still more tempting field of operations, so far especially as immediate results are concerned. I refer to cases like those of the blackberry (*rubus villosus*), and the dewberry (*R. canadensis*), also the wild cherries, the black cap and red raspberry, and possibly some varieties of vaccinium, among some of which at least it is commonly supposed hybridization has sometimes occurred accidentally, instances of which are supposed to exist in Ganargua, Shaffer's Colossal, and other raspberries.

Much has been already done in the improvement of both the blackberry and the black cap, and the work so done may reasonably be considered as supplying a most hopeful basis for subsequent operations,—supplementing nature instead of (as in the past) merely selecting what she shall supply ready to our hands.

As will naturally be inferred from the foregoing, we regard the multiplicity of our wild fruits, with the plentitude of influences tending to encourage variation, as affording one of the most promising fields now open to the curious and thoughtful pomological experimenter,—a field almost wholly unwrought, and which would seem to offer among its untried possibilities promise of results far more intrinsically valuable than have been the many triumphs that have so honored the noted experimenters of the present and past ages in the department of floriculture.

Among the many native fruits to which attention may very properly be drawn for this purpose we may mention the June or service berry, which, notwithstanding its tendency to variation and other promising and desirable peculiarities, seems never to have been taken in hand with the purpose of improvement. Between this and the dwarf form sometimes grown in nurseries there would seem to be promise of desirable results.

The papaw, or pawpaw as it is more commonly spoken (*asimina triloba*), which is indigenous to the south three tiers of counties, seems to hang upon the skirts of civilization with a pertinacity which demonstrates the existence of an ability to "take care of itself,"—a very notable characteristic of some of our popular fruits. May there not be reason for the hope that, if subjected to the processes of liberal and intelligent culture, it would sooner or later respond with results well worthy of perpetuation, with the requisite improvement in both quality and productiveness? So in the genus *carya* (hickory), the effort might be directed to obtaining the size of *sulcata*, the quality of *alba*, and the thin shell of *porcina*.

The blending of qualities by hydridization may, perchance, produce from a similar combination of our native *corylus* with *avellana*, a result hardy and prolific enough to warrant its introduction to market culture.

Our fellow citizen, B. Hathaway, by going back to one of the earlier descendants of our native *Fragaria*, has given us the Bidwell strawberry, among many others, and as proof that his hand has not yet lost its cunning, he has more recently and from the same strain originated others, some of which already manifest a vigor and productiveness calculated to beget strong hopes of future value. This field is being actively occupied, and it is just possible that even that Arab among strawberries, the Wilson, and its soft, feminine mate, the Crescent, may be yet overmatched, if not among the "Has-beens," then possibly among the "Is-to-bees."

Juglans, both *cinerea* (butternut), and *nigra* (black walnut), often vary greatly in size, if not in quality also as grown wild, and hence the careful selection of seed for planting would no doubt secure improved results.

Our wild yellow or red plum (*Prunus Americana*) naturally runs into numerous varieties, and it seems probable that this or its combinations with *P. chicasa*, might become the means of securing desirable results.

We have already referred to the several indigenous wild cherries as affording a promising field for hybridization. It may be a matter of grave doubt whether hybridization between them shall be found even possible: still their diverse peculiarities afford occasion for the belief that, once effected, the progeny must show decided variations, probably from both parents.

The gooseberries, even in the wild state, vary greatly. Enough has been already affected with them, to encourage the hope that by continual selection and hybridizations, we may be able to rival the English in this fruit; if not in size, at least in quality.

Our native Sambucus (elder) is so objectionable on account of its persistent disposition to emit sprouts that we doubt if it would prove even tolerable in cultivation. It is, moreover, so little inclined to vary that there seems but slight encouragement for the efforts to improve it.

The varieties of *Vaccinium* (blueberry) are so numerous, and their peculiarities so distinguish them from each other, and, moreover, some of them, and especially *corymbosum*, vary so considerably in both size and quality as to afford ample ground for the hope that, as the result of cross fertilization, or the selections of seeds and seedlings, something of real value may be obtained. The tall, bushy *corymbosum* would seem to offer the greatest promise in this respect, on account of its stronger growth. The small size of the plants of the other blueberries, as well as their peculiar demands as to soil, shelter, etc., may be found to be serious obstacles in the way of their profitable utilization, under cultivation, notwithstanding the fact that even in the native form their productiveness, size, and quality have always given them a position in popular estimation. The suggestion is occasionally heard that experiment would be likely to deduce desirable results from this family of natives, still, so far as we are informed, this field remains wholly unoccupied.

Viburnum opulus (tree cranberry) may perhaps be made to develop something useful, under expert treatment, since it can be readily subjected to garden culture, but so long as we have, as its alternate, that prolific denizen of our marshes, the American cranberry (*Vaccinium Macrocarpon*), we are likely to rest content with this as the basis of our operations.

The genus *vitis*, in some of its forms, is at home in most sections of our State. *Cordifolia (riparia)*, evinces some tendency to variation, within rather narrow limits. *Labrusca* occasionally occurs in the more southern counties. We are not sure that *æstivatis* is really a native of our State, although very common and successful as an introduction, under cultivation. As evidence of the susceptibility of this family to improvement we only need point to the wonderful results of the efforts for this purpose, so persistently carried on by the grand army of experimenters during the last quarter of a century—results that promise to transfer to America the title, the home of the vine, so long arrogated to their locality by the residents of Southern and Central Europe, the right to which seems now to be sadly endangered by the rapid improvement of American varieties, as well as by the inroads of that insidious enemy, the phylloxera.

In the shallow water of very many of our lakes and estuaries the Indian or wild rice (*Zizania aquatica*) finds a congenial home, supplying a valuable article of food to the red man of the forest, with an abundant residuum, which is usually appropriated by hordes of aquatic wild fowls.

To the white man, whether as an article of food or of commerce, its color alone is an objection to its common use, to say nothing of the other difficulties in the way of its profitable utilization. Still, in certain localities there are immense unproductive tracts adapted to the growth of this plant, and, apparently, to little else. Hence we indulge the suggestion that intelligent and thoughtful experiment, coupled with careful study of the capacities and requirements of this plant, may, perchance, rid it of some of its more objectionable peculiarities, and develop processes through which large tracts of otherwise waste territory may be profitably utilized, and at the same time a new food product, in a measure proof against summer drouth, as well as winter cold, be given to our people.

We have thus hastily noticed some of the more prominent possibilities for improvement among the indigenous fruits of our State, not so much to mark out a line of operation, or even a course of experimentation, but rather to point out the apparent possibilities, and to furnish food for thought to the curious and considerate, at the same time affording a basis of ideas out of which to elicit discussion, and draw out such ideas or facts as those present may be able to bring to the elucidation of the subject, which is exceedingly broad and diversified. If we look backward over the history of our race, recalling the fact that probably none of the products, whether vegetable, cereal, or animal, upon which man habitually depends for sustenance were originally given to him in their present highly artificial and improved condition, but have rather come down to him as the result, generally, of purely accidental variation, under culture, not generally of the most effective character, we, in a State so unusually prolific of the material out of which all this has been wrought, may well look about us and consider whether, with this mass of material ready at our hand, and with all the lessons taught us by modern science, together with the experience of the past, we may not hope to realize in other directions and with new material, results more prompt, certain, and effective, the outcome of a more matured knowledge of the operations of nature's laws.

W. A. Brown: Has any one experimented in naturalizing the wild huckleberry?

Mr. Jones, Benton Harbor, in response gave his experience in transplanting the low bush huckleberry, which had been quite satisfactory.

Mr. Lyon gave an account of his work with the wild gooseberry. The smooth one had been taken and cultivated, and under treatment had borne as prolific crops as the common red Dutch currant.

Mr. Satterlee, Greenville: It seems to me in proper hands a great deal might be made of the varieties in the nut-bearing trees. I have noticed in walnuts, butternuts, and chestnuts on my place considerable variation in the quality of the meat, the thinness of the shell, and the depth of the sutures. By selection, even, it occurs to me something very valuable might be obtained, although it might take a long time.

Mr. Sammons: Has any one grown the chestnut long enough in Michigan to know just what kind of a success can be made of it?

Mr. Satterlee: I planted a grove eighteen years ago and last year at the suggestion of Prof. Beal I made some measurements. One of my trees 30 feet high measured 33 inches in circumference a foot from the ground. These trees some of them bore the eighth year after planting them out.

Mr. Holt: Upon my father's farm on the Thornapple river, in Kent county, there is chestnut orchard that is doing admirably.

Mr. Tracy: I met Mr. Satterthwaite, of Pennsylvania, who told me about his experience with chestnuts. Although he has a model pear orchard, still his chestnut orchard he makes the more profitable per acre. He too has noted the variation. One variety is larger, earlier, and of better quality, bringing double the price in market.

J. A. Keyes, Whitehall: Will not one experience a good deal of difficulty in transplanting the chestnut?

Mr. Satterlee: Yes, the chestnut belongs to the tap-rooted trees, and transplantation when quite young is desirable. But the one thing needful is to have them out of the ground as short a time as possible.

Mr. Jones: I had a thrifty chestnut standing alone on my grounds which blossomed for years but did not bear fruit until I secured a mate for it.

VARIETIES FOR THE NORTH SHORE.

The above subject was next taken up and upon request Mr. J. J. Hubbell, of Benzonia, spoke first upon the topic.

Mr. Hubbell: We are not old enough in Benzie county to know just what we do want or what it is most desirable to have. Yet as the years come and go, leaving with us bits of experience, we are getting at lists of varieties that seem best adapted to our climate. Of the Red Canada which is so much lauded in the southeast of our State we have but two bearing trees in our county, but we have done a good deal of top grafting to this sort. Our Ben Davis trees are being worked over to this variety.

Mr. Lyon: Is the Ben Davis even tolerable with you?

Mr. Hubbell: No, we don't raise any better ones than other people. The Northern Spy does well with us, but we have to wait 15 years for any returns.

Mr. Lyon: Are you troubled with black speck in your Northern Spys?

Mr. Hubbell: No, not in the least. After 20 years' experience I should place the Golden Russet at the top of the list of market varieties. The Rhode Island Greening is not quite hardy with us. Here is the family list of varieties made by our county pomological society that may give you a notion of our ideas upon sorts for our locality:

FOR AN ORCHARD OF FIFTY TREES.

Summer.

Early Harvest	1	Red Astrachan	2
Sweet Bough	1	Wine (Benoni)	1
Primate	1	Summer Pearmain	1

Fall.

Hawley	1	Porter	2
Lowell	2	Maiden's Blush	2
Gravenstein	2	Chenango Strawberry	2
Jersey Sweet	1		

Early Winter.

Belmont	2	Bailey Sweet	2
Fameuse	2	Westfield Seek-no-farther	2

Late Winter.

Talman Sweet	2	Red Canada	8
Golden Russet	5	Northern Spy	2
Wagener	6		

Mr. McClatchie: We have no trouble in growing the Baldwin with us in Mason county.

Mr. Hubbell: With us the Baldwin is very uncertain. It kills at the top and splits at the bottom. We have some fine orchards of this variety however. But in choosing a location for an orchard of this variety one must seek a place where tender peaches will succeed.

Mr. Antisdale: It seems to me that if the Baldwin were grafted on some strong stock like Northern Spy less difficulty would be experienced from winter killing.

Mr. Smith: No rule will work for two localities a few miles apart. In Michigan almost every township and certainly every county must have its test experiments before a list of varieties can be recommended.

Mr. McClatchie: I have had miserable success with Red Canada in my orchard. The fruit is scabby. I would not set a tree of it were I to plant a new orchard.

Mr. Lyon: In an experience of forty years with this variety I have noticed that it wants a heavy, strong soil to succeed well, and in almost every instance where it is condemned on account of scabby fruit the soil is light or poor.

Mr. McClatchie: That hits my case exactly. My soil is sandy. In the east of the State I am told the Baldwin will drop 20 per cent of its fruit when the Red Canada will lose less than five per cent.

E. Buell, Kalamazoo: I most heartily accord with Mr. Lyon's view from an experience nearly as long as his own. The Red Canada on strong soils is a grand variety and never cheats its owner.

A very enthusiastic discussion followed upon varieties especially for market.

A majority argued that outside of every other consideration the commercial fruit-grower should raise what sells best in the large markets. One gentleman said that at the time when shipments were made to the far south the Pennock was the most valuable apple in the market, a variety which none of us here would touch if anything else were to be had. Baldwin was mentioned as the last variety almost that the housewife would select for cooking or the children for eating, still on the market it is number one. Others mentioned the Bartlett pear and Crawford peach as examples of market varieties which do not stand high in quality. The discussion seemed all one-sided until Professor Tracy remarked that if we plant the varieties popular in market to-day, by the time the trees, especially apple and pear, reach maturity, the public taste may have radically changed. It takes "a long look ahead" to decide upon the best market varieties to plant. As people buy and eat fruit more, they become somewhat educated in sorts and recognize by form and color the varieties that meet the wants of the palate, and will not be deceived. The Seckel pear at one time could scarcely be sold on the great markets because of its inferior appearance; it took years for people to learn the exquisite quality of this variety, but once learning it, the Seckel was at the top of the market.

This will be found especially true of western markets. Fruit has been until recent years a scarce commodity; people would take anything of the apple kind and be glad of it, asking no questions as to name or pedigree; but as the years go by, and more fruit is thrown upon the market, a wider range of varieties and a fuller pocket-book will change the demand, and the commercial grower must have divined this change long years before to be ready for it. We must all remember that in setting orchards which shall supply our markets twenty years hence, a good deal of regard must be given to quality. All agreed that the Golden Russet was an exceptionally good variety for northern Michigan; Duchess of Oldenburg was named as a very profitable early variety, and several members pushed forward the Jonathan as the apple that will be called for largely in the markets twenty years hence. Mr. Tracy said that fruit lists must be made from the experience of a neighborhood. A man on one side of the State could not dictate the best varieties for the other side, and oftentimes we may find a variety doing very nicely as a young tree in a locality that soon breaks down and becomes valueless when it ought to be at its period of greatest profit. This is notably true of the Belmont in the Traverse region.

Wednesday Evening Session.

The question box occupied the attention of the meeting for a half hour.

No. 8. Are any of the birds now protected from destruction by the laws of Michigan injurious to the fruit-growing interest?

Several replies were made in which the robin, cherry bird, and English sparrow were abused roundly, for damage done the ripening fruit, while not one was present to defend them on the score of assistance rendered by eating up worms and noxious insects. The English sparrow received the greatest condemnation, one gentleman taking the ground that a life sentence in the penitentiary was no more than an adequate penalty for introducing such a terrible pest upon our shores.

No. 9. Will some one give us northern people light upon the yellows?

This question was quite fully answered, but no facts were brought out that are not to be found in the volumes of our society.

No. 10. What varieties of peaches are best to raise which are later than the Early Crawford?

Late Crawford, Hill's Chili, and Smock were named, but objection was made to the second named variety, that it was so inferior in quality as to be unworthy of planting; another objected to Smock for northern Michigan because it would not often ripen.

No. 11. Will some one tell how best to fight the pear slug?

The Secretary said upon this very subject he had a communication from S. W. Fowler, of Manistee, which would answer the question. It was read as follows:

Charles W. Garfield, Esq., Secretary State Horticultural Society:

Dear Sir:—Until yesterday I hoped to meet with you at Pentwater, but unforeseen professional duties prevented. As I have not seen or heard of a perfect remedy against the ravages of the black slug, I venture to send you the following:

The slug, a genus of gasteropodan mollusks of the division of *Monœcia* (hermaphrodite) is of the family *Belicidœ*, which is closely allied to the snail family, but has no external shell. They are from one-quarter to one-half inch in length, and have an oval or oblong body, and those more frequently found in Michigan are of a dark brown or black color. Their eggs are of a jelly appearance and are generally found in most places, and at the roots of grass in small clusters.

The skin of the slug is not porous, like that of the fly and most insects, and cannot therefore be destroyed by throwing poisonous or other powdered substance upon its body. It is a dainty feeder and selects choice young cherry, or pear trees first for its feeding ground if convenient, but they do not stop there; they will attack any tree, old or young, and in many instances they have stripped and killed large and valuable orchards. They are so small that they are seldom observed until the mischief is done. They touch nothing but the leaves and fruit; these they speedily devour or kill, and of course the trees being stripped of their leaves, die. The leaves are not all eaten, but the sap is taken and small holes eaten through, so that they turn yellow, and have the appearance of having been scorched by fire. I have been thus tediously particular in describing the slug and its operations because it is frequently the most difficult and dangerous enemy the fruit-grower has to contend with. It generally appears in June and frequently continues its devastations until late in the summer. For two years I tusseled with the black slug in my garden without avail. The first year they appeared in small numbers and killed only one or two small cherry trees, but the next year they came *en masse*, and not only killed five large choice pear trees, but attacked the fruit so that pears three inches long lost all vitality and became husky and dry, like a hornet's nest. I tried ashes, sulphur, lime, tobacco juice, and everything I could think or hear of, to no purpose, until in very desperation, when they made their appearance the third year, evidently intent on completing their work of destruction, I put one-quarter pound of Paris green in four gallons of water, took an ordinary brass force pump, such as is usually used for cleaning store windows, and with a fine nozzle I threw the poisoned waters in the form of spray, far above and over the trees, so that every leaf was touched. The next morning, on examination, I found every slug was dead. Eureka. I had conquered. My orchard, worth more to me than money, was saved. They could not eat the leaves, or suck the sap without partaking of the fatal dose, and if this little article will lead to the saving of other trees or orchards I shall be more than repaid for the trouble of writing.

The first paper of the evening was given by Mr. Hartwicke, of the Pentwater News, upon the topic

OCEANA COUNTY FOR FRUIT.

The man who engages in the business of fruit-raising usually becomes so much in love with the occupation that he makes the location which he selects for his orchard his home, and in looking over the advantages of our county for fruit we find that aside from adaptability of climate and soil, it has one advantage which has not been referred to in this meeting, but which nevertheless will commend itself to the horticulturist as an important one. I refer to the general health of the county, to illustrate which I will give a few statistics taken from our supervisor's report, which were gathered by him with great care, and which may be taken as a fair indication of other towns. The population of Pentwater, April 1, 1882, was about 1,400. The number of deaths occurring in the township during the year ending March 31, 1882, was 20, of whom 11 were children under the age of two years, some dying at birth and the others of diseases incident to children of that age. Of the nine remaining over two years of age, five were taken sick while in Manistee, Ludington, and other places and brought to Pentwater to die of disease contracted elsewhere, leaving only four over two years of age who died of diseases contracted in Pentwater.

In 1838 one John T. Blois published a Gazetteer of Michigan in which the history and characteristics of Oceana county were described and set forth in space occupying eight full lines. From this work we gather the information that "Vegetables, vines and grains grow in this county in great luxuriance, and good crops are frequently produced upon pine lands," but not one word indicating its adaptibility to fruit-raising.

Years after, when we hear of Michigan fruit attracting attention in Chicago and Milwaukee on account of its superior quality, form, and size, and the regularity with which it made its appearance in those markets, notwithstanding the cold waves, followed by blasting frosts which frequently swept over the country, totally annihilating the crops of our Buckeye and Hoosier neighbors, we are put upon our inquiry and find that a certain locality bordering upon the great lake, of which St. Joseph seemed to be the centre, was producing this marvelous fruit, and the section had acquired the reputation of being the Michigan fruit district, some locating the northern boundaries of this district in Allegan and others in Ottawa, but none were so reckless as to hazard an opinion that fruit could be grown with any degree of success north of Muskegon.

Occasionally southern Michigan would hear from us through some land-hunter, who would tell wonderful stories of our wild fruit products, coupled with a prophesy that this would some day develop into a great fruit-producing country; but the reports were passed as idle stories or visionary speculations of sand bank speculators, as the soil was considered too poor and the climate too cold. But when in 1865 Professor Winchell, after close study and careful comparisons with reference to a narrow strip extending along the east shore of Lake Michigan, announced that it "possessed an exceptional climate to the great advantage of agricultural and horticulture capabilities," more credence was given to the lumbermen's stories and a few venturesome persons had the hardihood to experiment with our climate and soil by planting trees which they neglected to care for; and yet, notwithstanding the adverse criticisms on our climate and soil and the neglect of those who planted them, those trees soon commenced to advertise us by their wonderful products, which an Oceana man by the euphonious name of Shirts had gathered from the four quarters of our county and exhibited at the State fairs and pomological exhibitions in competition with the fruit of heavy lands and more southern clime, and captured many first premiums,—for many years nearly all the premiums on plums.

Following some of the early results of the fruit culture referred to came other encouraging announcements by Professor Winchell concerning the formation of our soils, and the climate of the eastern shore of Lake Michigan, indicating that success in fruit culture, even in this latitude, was possible, and inasmuch as his statements corresponded with the experience of our oldest inhabitants, preparations for fruit culture on a larger scale were begun, and occasionally a man would set out from one to two hundred trees, and when it was fully settled that the fruit district of Michigan was a belt extending the entire length of the lower peninsula on the east shore of Lake Michigan, known as the Michigan fruit belt, and that Oceana, with her neighbor Mason county, occupied the most favored position in that belt, by reason of their projection into the lake, fruit culture commenced in earnest, and to-day orchards varying in size from one hundred to twenty thousand trees, laden with fruit promises, are truthful witnesses of the adaptibility of our county to fruit-raising.

Each year has surprised not only our southern neighbors but ourselves with capabilities of our county, its elevation, water protection, and prevailing westerly winds enabling us to run the gauntlet of winter freezes and spring frosts safely, while our variety of soil, including all kinds from light sand to heavy clay, and the different loams, enables us to raise not only small fruits and peaches, but plum, pear, and grape in great perfection; and we have none of the diseases incident to the old fruit sections.

To those who have come here with the expectation of seeing a country cleared up and improved, with large orchards of old bearing trees, and the best known system of orchard labor employed, we expect our county will be a disappointment. But to those who are inquiring as to our fruit capabilities we feel confident that what we have already accomplished will furnish ample proof of Oceana's claim to position in the great fruit belt of Michigan.

THE VALUE OF FIXITY IN RURAL LIFE

Was the next topic discussed, and Senator Ambler made a very happy address in opening up the subject, filled with pleasant hits and good natured badinage. He was followed by Mr. E. M. Potter, of Kalamazoo, who read the following paper.

It is said that in most foreign countries, and especially in Europe, a youth is educated for a special occupation, and his eminent fitness for it depends much upon his oneness of purpose and the tenacity with which he holds to the true principles and practice of his profession. In most cases this is his best and chief heritage, and so much so that often when adverse circumstances come his lack of adaptation renders his capital stock partially useless. And although the emigrant may land at Castle Garden a skilled craftsman of a special art, he soon sees enough of the adjustableness of the Yankee so that when he gets a little further west he will tell you he can do "anything you may plaze, sir."

This prominent characteristic of our native-born citizens, namely, the ability to adapt one's self to circumstances, has had much to do with the development of our country, and while the foreigner wonders at this general adaptation he is also greatly amused at the perfect adjustability of our language and the way we use it.

The Frenchman said when he came to America and went into a store, if they told him the goods were "cheap" they were always "dear;" and when he took dinner at the hotel if he called for "deer" he always got "sheep." When our neighbor goes into a speculation and his profits are large we say, "Now he is well fixed," whereas if he loses heavily we say, "That last trade just fixed him."

Now I have not been told just in what sense we are to consider this word "fixity" at this time, but I apprehend that it is intended to refer more particularly to concentration of effort, and in this light we propose to consider it for a few moments, and in doing this we shall endeavor to show also how resources are often wasted. I am confident that the true principle of success is in not undertaking to do more than we can do well, and while one may be able to accomplish more than another even with no greater resources outside of his own management, we may profit perhaps in searching for the deficiencies. The very first preliminary of any legitimate enterprise should be a careful "inventory of stock," embracing the resources and facilities of all descriptions necessary to the business, whether it be money, physical, or nervous power, available labor, material, or markets, and if this "account of stock" must be partially estimated let it be under rather than overestimated. A little surplus capital is always convenient and a wonderful stimulant to good planning and efficient work.

One may spread his butter on so large a slice of bread as to be almost insensible of its whereabouts. So with human effort and capital, and yet he who is always planning and never working will fail to accomplish much. What we urge is the proper combination of intelligent purpose and industrious enterprise. "A little farm well tilled" is far better than a whole section half worked, and we pity the man who never sees any prospect of enjoyment until he "owns all that joins him," and at the same time suffers the burdocks to bloom in his door-yard.

We are indeed sorry for the boy who is compelled to milk four or five half-fed cows when one or two well cared for would yield just as much milk and not torment the boy half as much. We commiserate the man who lounges away the winter and then tries to compensate by sawing wood before breakfast during the hot summer. How sad is the condition of the overworked housewife whose weary arms must bring the fuel from the woods or fence corners to cook the meals. Not long ago we read about an instance of this kind when the careworn mother had pleaded for a woodpile until "forbearance ceased to be a virtue." One day the husband came in at noon with two or three harvest hands, all hungry as bears, but the table was bare too of everything but cloth and dishes, while the cook stove was as cold as an ice-box. He stormed around some until his good wife made her appearance from another part of the house in answer to the summons, "Where's the dinner?" "Where's the dinner?" when she meekly replied, "There was no wood, so I hung it up in the hottest place I could find on a ladder on the south side of the house, but I can't tell you just when it will be cooked." I presume she never had occasion to repeat the experiment.

But oh! how deplorable is the condition of him who puffs or chews away ten or fifteen dollars every year in the use of tobacco, and then loads down his offensive breath with the plea that he cannot afford to take the papers or join a horticultural society.

Now don't say all this talk is irrelevant to the question, for at the outset I proposed to show how resources were often wasted. Perhaps some of my remarks may be be called side issues, but we insist that the last mentioned way in which capital and nerve force is directed is a regular front issue and we can't always "dodge it either." What we have already said will apply in a kind of general way to all commendable undertakings, but we have some additional suggestions which may be of practical importance to the horticulturist. After one has already made at the outset a complete inventory of all his available resources there remains much thought to be given to the time, place, and manner of using them. Don't be so anxious to secure so much land while it is cheap as to leave no capital to improve it successfully, for if all did so it would always remain unimproved with little or no appreciation in value, and finally show a costly and unsatisfactory result. Still we may safely say that a quarter of a section in a body can be well cared for with less outlay than eighty acres scattered over a quarter of a township. I believe it is generally conceeded that the nearer a team is hitched to a load the more they can draw if they have good footing. So it is an advantage for the home to be near the work. There is no definite plan which in all cases would be best for the arrangement of either the fruit orchards or the farm crops as the diversity of soil and situation are such that one must well consider beforehand which is best adapted for a special purpose or what will be the best possible treatment. The facilities for information in these latter years are such that one need not go far astray, and if we can always realize how the years speed on we shall be inclined to make the most of our allotted time, whereas much of it now goes to waste for the lack of good forethought. Study well how to save time and steps.

When I was a youth I made an errand to one of our neighbors who had but an hour or two before sent a man and team to do some work nearly half a mile away. But all at once it occurred to him that something else ought to be done just then, so he summoned the man and team back and when they arrived he found the whiffletrees were needed also. Thus another useless trip was made for them and an hour or two wasted just because the work for the day was not well planned. The incident was a loss to the neighbor, but perhaps it made an impression which was of benefit to that boy in after years.

I am aware that oftentimes there are unforeseen circumstances which will intervene to interrupt one's best plans, but in a measure we can by proper consideration make allowances for these, should they occur, so if they do come it will be well and still better if they do not. I am inclined to the opinion that a leading specialty for which one is best fitted and the location and surroundings are best adapted will generally prove the most successful for the reason that the cost of production is comparatively less, and when one's name becomes known in connection it affords a better market for his productions. I do not advocate one specialty and that alone, because one's yearly income might be cut short by some unusual disaster, but a leading specialty with sufficient other crops to help well along in the support of a family. After one has his grounds occupied with certain crops, and has procured the necessary implements it is a great mistake to make a change just because some one has made more money for a single season with something else. And yet after one has followed a specialty for several years and finds that by a change of established conditions he is not succeeding as well as formerly, and is convinced by actual observation in his locality that a change is desirable, let him make it. When one embarks in any enterprise with a great outlay for permanent apparatus or conveniences if he does not lose any money the first year he may be pretty sure of good profits afterwards with less outlay and greater experience. Some men can plan faster than they can execute, others can execute better than they can plan, and when these two very desirable qualities are combined in the same person they should always be driven tandem with the planning well ahead but not allowed to break the traces and skip out of reach.

Mr. D. L. Garver next read an essay on

PEOPLE AND THEIR SURROUNDINGS.

"Wisdom is justified of her children, and a man may be known by his surroundings," in fact a man's surroundings that he makes himself are his exact measure. The farmer is an exceedingly practical man, and not very ornamental. The nature of his calling is such that he is obliged to study economy, but there is no occupation in which one can combine the useful and ornamental so advantageously as on the farm. And it will be my purpose in this paper to give some hints at a few of the many ways by which the home surroundings can be made both useful and ornamental.

In this northern climate a good wind-break, if grown at a proper distance and in the right direction from the dwelling, is a very cheap luxury. And this may be made with our native forest evergreens, of which the hemlock and arbor vitæ are the best. Arbor vitæ is very easily grown, but hemlock must be well sheltered from the sun and wind for several years until the body of the tree is properly protected by the foliage; then it may be trained in any shape you wish, and if properly managed it goes as far toward making the home surroundings look cosy and comfortable as any other one thing about a place. But if there is anything in farm life that a farmer may be justly proud of it is a well kept orchard. It combines the ornamental with the useful in perhaps a higher degree than any other thing that goes to make up the home. To make the best selection of apples, peaches, plums, pears, and grapes, and properly cultivate and train them requires as much judgment and fine distinction as it would to qualify a man for a lawyer or a judge.

A few well trained grape vines about a dwelling, and no matter whether in the country or in the village or city, there is always room enough, some place about the dwelling for grape vines, and the kitchen slops, if properly applied, will produce grapes enough for the use of the family.

But now I wish to call special attention to a branch of the subject that hitherto has not been so commonly treated, and that is the planting of shade trees on the road side. And I wish I could live to see the time when every mile of public road in the State of Michigan will be lined on either side with shade trees. For this purpose there is nothing superior to the hard maple. And in this connection I wish to make a few suggestions that are not visionary but practical.

First we must plant the trees, and this must be done in the most thorough manner; then if they are properly cared for they will not die. When they are five years old we can attach barbed wire to them, and use them for fence posts, and when they are twenty years old we can commence to tap them and make maple syrup. And I suggest this to show how simple and easy it is for farmers to beautify their homes and yet utilize it for so many good purposes. Here, then, we have combined an added beauty, an abundance of shade to refresh the weary traveler, everlasting fence posts, and a sugar orchard. And I need not tell you that maple sugar and syrup are as good luxuries as the world ever produced. And shade trees planted on both sides of the road would enhance the value of real estate many times the cost of growing them.

The State should make a law providing for the planting of trees on every mile of road in the State [this is already done.—SEC'Y]; then the traveler could move all day in the cool shade, and could be sheltered from the rain under the foliage; the roots of the trees will mat under the road and make a more solid bed; the shadow of those trees thrown across a field on a frosty morning will prevent the frost from damaging the crops; if potatoes are planted where these trees shade the ground part of the day, the bugs' eggs will not hatch. The wind is broken in summer, preventing dust, and in winter the bleak storms are modified. Trees also help take up the malaria in hot weather and transform it into vegetable growth, thus purifying the atmosphere. They form a convenient nesting place for the feathered songsters while feeding their young upon the innumerable insect pests that prey upon the farmers' crops. If every farmer will go to work and beautify his surroundings he will help to make the world better, and his children's children will rise up and call him blessed.

But what a contrast there is between a home with these surroundings and that of a family living in a dilapidated dwelling, with the outward adornments of perhaps a few unkept fruit trees, with bare road-sides, the dwelling to be reached by climbing a rail fence, and the inside adornments perhaps composed of two dogs and five cats, by means of which and the aid of ten hogs, they succeed in raising fleas for the rest of the family, who drag out their long days and nights in brooding over life's miseries, instead of working out their own salvation by making their surroundings contribute to their permanent happiness.

I might go on indefinitely to show the similarity between man and his surroundings, for there is a general law of nature that like seeks like, and like produces like, and therefore wisdom is justified of her children, and a fool is known by his folly; or again, a man's surroundings are his exact measure.

REPORTS OF COMMITTEES.

The Committee on Transportation reported substantially as follows:

1. It is not best for our Society to take positive action in connection with securing railway arrangements, for it is not really a part of the Society work.

2. Local societies can very properly for their own localities accomplish what is necessary for the fruit-growers of their vicinities.

3. North of Muskegon fruit-growers are not far enough along to dictate terms to the transportation companies, for they have not bulk enough to ship to warrant them in so doing.

4. South of Muskegon local societies have already done what work is necessary to accomplish satisfactory results this season, having a fruit train running regularly every day to Chicago.

Report accepted and adopted.

The Committee on Exhibit, through Professor Tracy, made an excellent report upon the elegant stage display made by Mr. Hudson and his lady associates.

Mr. Smith, of Benton Harbor, chairman of the proper committee, reported a series of appropriate resolutions which were adopted by a rising vote.

Several gentlemen remarked upon the generous hospitality of the citizens of Pentwater in furnishing the delightful excursions and in caring so sumptuously for the guests from abroad.

The Secretary reported the action of the Executive Board by which the annual meeting was placed at Flint, Genesee county, early in December.

Adjourned.

MIDSUMMER PAPERS.

HORTICULTURE vs. RUTS.

AN ESSAY READ BY T. T. LYON BEFORE THE MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.

If we may accept the demonstrations of the mathematician and the scientist, and their theories as well, we will be almost unavoidably brought to the conclusion that the great congeries of planets designated as the solar system, as well as that intangible and illimitable aggregation known as the universe, in which vast worlds wheel their ceaseless rounds under the control of definite and unvarying laws, is but an immense congeries of ruts, devised by the great author of all things; including here and there the erratic track of a comet, thrown in to quicken our apprehensions by the possibilities, real or imaginary, of collisions on a scale too grand and calamitous for mere human conception, but whose paths may nevertheless be only ruts, so complex and involved that we are unable to trace them.

As in the universe, so upon our lesser planet the laws of chemical affinity, as well as those which control animal and vegetable life, are, in an essential degree, inflexible; so that the constant changes going on around us mainly proceed in regular and recurring cycles; in other words, in ruts, with only here and there an erratic or modified case consequent, possibly, upon the operations of that disturbing element in the problem, man, who would seem to have been introduced upon the planet, or to have subsequently become an element of discord thereupon, or as a modifying factor in the otherwise fatalistic problem. The lower animals, as well as birds and insects, are inflexiby guided in the selection of their proper food, in the location and construction of their nests, in the provisions to be made for their periodical changes as well as for the changes of the seasons, by laws apparently inherent in their natures, of whose mode of operation we can have no real conception, except as exemplified by their acts, in compliance with their behests. These are, therefore, merely ruts, devised by the great author of all things, to direct them infallibly in the fulfillment of their missions.

Although it sometimes seems difficult to draw the line of demarcation between the results of what we are pleased to designate as instinct and those attributable to the operations of human reason, man does not hesitate to arrogate to himself the sole possession of the latter; although he doubtless, as the rule, fails to realize how much of real responsibility hinges upon that assumption.

It is, of course, this ability to devise and establish premises, to draw conclusions therefrom, and to apply these to the working out of valuable or otherwise important results, that entitles man to the post of honor, and imposes upon him the obligation to "act well his part."

He is reputed to have initiated his six thousand years' residence upon the earth as a horticulturist. But alas, an expert contemporary succeeded in, very summarily, throwing him out of his first or horticultural groove, leaving him only the alternative to try his fortunes, in the then undeveloped general field of agriculture, from which during the long period named he has been able to win the sustenance of the race; although it is sometimes very distinctly charged (and with warrant, if we consider certain modern discoveries), that he has wasted even more than he has been able to utilize. Be that as it may, it is clear that during his long occupancy of this field he has succeeded in withdrawing the grains, the domestic animals, and various other products of nature, from the grooves in which they were originally wont to exist, and in very greatly increasing their capacity to administer to his support. However much or little credit may be really due to the race in this direction, to our apprehension one of its constant and distinguishing characteristics has been a persistent disposition to follow the ruts previously worn by others. It has ever been a peculiarity of agricultural ruts that, while comparatively few in number, they are, by consequence, the more deeply worn, and hence the more readily followed. In the horticultural field, on the other hand, while ruts are to be found in greater numbers, they are less clearly defined, and hence more readily escaped and less likely to be persistently followed. Notwithstanding this fact it is believed to be the besetting sin of horticulturists, in common "with the rest of mankind," to drop into one convenient or seductive rut after another and implicitly follow them, oblivious of the conceded fact that eminent success can only be gained by taking prompt and intelligent advantage of modifying circumstances as they arise, as well as by a thorough and comprehensive grasp of all the conditions of the problem to be solved. In horticulture (of which we regard the pomology of to-day as a branch or off-shoot) more than in most pursuits of an agricultural character, success lies, very largely, in the thorough mastery of a variety of not very obvious, although essential, particulars, and in the acquired ability to intelligently apply these particulars at the right time and in the proper manner. The recognized existence of this fact would seem to give force to the very common assumption that, more than most others, horticulturists are, or should be, thinking men. True as this may be, they have to do with ruts that must be followed as well as with yet others which they sometimes unconsciously, and perhaps improperly, follow. To illustrate: Nature has provided for certain forms of cacti a special rut, out of which they are obstinately unsuccessful. Many years since an English grower of plants, an expert in his calling, received one of these then novel and curious plants, to be carefully nursed and developed into bloom. Following the stereotyped plant-grower's rut, he nursed, watered, and watched over it with the most solicitous care, but all in vain; it persistently refused to honor his efforts, till, at last, wearying of the trial, he, in disgust, cast it under the stage of the greenhouse, where, thrown upon its side, it was abandoned; when, presto! the obstinate plant found itself in the rut marked out by nature, and soon developed into bloom. It had acquired under neglect the dry, arid condition indispensable to its prosperity. The fuchsia is one of the most attractive of ordinary conservatory or parlor plants, but nature has located its rut in coolness and shade, and the follower of ruts who, in our climate, oblivious of this peculiarity, attempts to compel its adaptation to a warm, sunny exposure, will need but a short time to become assured that it will not take kindly to the change.

No one but the agricultural horticulturist will, we trust, either plant an orchard in a grain field, or sow grain in an orchard, from unwillingness to waste the use of his land; and he will surely learn, in the expensive school of experience, that the two cannot be made to prosper in the same rut at the same time.

The very wise and considerate young horticulturist may imagine that nature is mistaken in restricting the growth of his cherry trees by causing the outer fibrous bark to encircle the trunk, and either slit it vertically with his all-correcting knife, or otherwise peel it wholly away; but the outcome will certainly convince him that her mistakes are less common than he had supposed, and that she rarely exchanges ruts with even the most expert horticulturist. The emigrant from the cool, humid climate of old England, whose subdued temperatures and mellow lights are born of the tepid waters, tempered and kindly loaned her from beneath the fervid suns of Uncle Sam's domains, will have, under these conditions, worn for himself a rut, in which he will probably essay also to travel on this side of the water, telling us to use the knife freely upon our orchard trees—"open their heads and let in the air and light;" but time and experience will not fail to teach him that this rut is not one of nature's devising, but a mere local expedient rather, and not to be tolerated here—especially not under the brighter and more arid skies of the west, with its extreme alternations of temperature.

On the other hand, there are those among us, even "to the manner born," who tell us that, at the period when the horticultural afflatus may be expected to inspire them to action, and when their impulsive jack-knives might be expected to marshal themselves against the persistent efforts of nature, possibly for the repair of earlier mistakes, they manage to "lose" these, to them, objectionable implements—meaning to be understood as in the main opposed to their use, thus, in dissent from the former idea, vibrating, pendulum like, to the opposite extreme, and making to themselves a counter rut, possibly quite as far aside from the true and proper mean. This very human tendency to draw conclusions and fall into practices based upon an inadequate conception of principles or facts, often, if not, indeed, usually, accepting the conclusions or practice of others at second hand, lies very largely at the bottom of the faulty practice and unprofitable rut-following of those engaged in horticultural pursuits, to say nothing of "the rest of mankind."

Of all those who grow the peach, how few have discovered that nature has established for it the invariable law that neither foliage nor fruit shall be produced from wood of more than a single year's growth; and hence, that the life of a shoot beyond the second year, except by an extension of its growth, is impossible. Upon this fact, or in this rut, lies the basis on which must depend any and all successful management of the peach tree. Its extreme tendency, at least in our climate, to the continuous elongation of its stronger shoots at the expense of the weaker ones, justifies, and in some sense necessitates, the "shortening-in" system of pruning as a means of forcing a continuous growth upon the weaker central shoots; thus supplying them an annual crop of buds for the production of foliage and fruit, and rescuing them from otherwise inevitable death. Let us for a moment contemplate the not infrequent attempt to ignore the fact that nature has, in some sense, devised a special law, obedience to which is essential to the highest success and most complete development of each family of plants, and the tendency of man to apply his own Procustean ideas alike to all. An assumed expert of this school, having shortened the more rampant shoots of his peach trees with satisfactory result, and having, with the practiced eye of an artist, brought them to the approved form, proceeds next to bring his pear trees, and anon the apple also, into the same favorite rut; only to learn, possibly after years of misdirected effort, that with some varieties of these fruits, while his trees may become assimilated in form to the desired model, the process involves the removal in whole or in part, of the possibility of fruit.

Done with these, he wends his way to the small fruit plantation, and deftly licks his raspbery and blackbery plants into a satisfactory form, and nature says yes, this will do. Emboldened by success he next attacks the currants and gooseberries, whereupon Dame Nature compromises the matter with decided indications by perhaps giving him large and beautiful fruit, but very little of it.

But the afllatus is still strong upon him and impels him next to the lawn, where, in the working out of his model upon the shrubbery he is ultimately made to comprehend that shrubs blooming from the last season's wood yield but a partial and dissatisfied assent to the application of his strait-jacket, which despoils them of very much of their incipient bloom, while most of the spiræas, with many other plants of similar habit, can only be shortened or sheared with the entire loss of the season's bloom. In certain pursuits involving a division of labor, an operative, by continuous manipulation of a single process, may become so expert that thought ceases to be a necessity; the deeply worn rut comes to be an unerring guide. Unfortunately, doubtless, for the perfection of the manipulations, but fortunately for the mental status of the operative, in horticultural pursuits this condition of affairs very rarely becomes possible. On the other hand, in this specialty we have to do with trees and plants brought together from dissimilar climates, and from varying conditions even of the same climate, all of which particulars must be studied, both separately and associated, in the case of each class of plants before we can surely determine the rut in which it will most surely and fully respond to our efforts, while the neglect of any of these essentially modifying particulars will quite possibly, as with the considerate artist who selected a grazing cow as the standpoint for a picture, find his plans thrown into confusion and his work a failure. Besides the agricultural ruts of which we have already spoken, horticulture seems to be essentially complicated with other ruts almost innumerable, some of which may be designated as botanical ruts, by the study of which we might, perchance, become wise enough to determine whether the pulp or the pit of the peach is the fruit; whether tomatoes, potatoes, melons, and pumpkins are in fact vegetables or fruits; and even to discover the true reason why the fabled pumpkins did not grow on the oak. In one of these ruts we might, if only blessed with the requisite acuteness of vision, follow in the track of Prof. Burrill, and be able to finally and authoritatively determine the question whether bacteria are really vegetables or insects, and whether they are the actual cause or only a concomitant of blight and yellows. Lastly, though by no means least, horticulture is complicated with entomological ruts. In the study of these some very acute plant-grower might be able to win the everlasting gratiude of his compeers by the discovery of some means of propagating and fattening the red spider and scale insect short of a resort to his pet plants for the purpose. The orchardist and nurseryman also might hope to discover some other pasture so satisfactory to the aphis and his reputed dairyman, the ant, that it would be accepted in place of his trees, to his no slight relief and gratification. And if, furthermore, he could succeed in persuading the curculio, and even the codling moth and borer, back into the ruts occupied by them prior to their discovery of the plum and the apple, he might be almost, if not altogether, prepared to hail the events of the millenium of horticulture; though he will hardly be able to felicitate himself upon the actual arrival of this much-to-be-desired era till (after investigating the ruts of commerce) he shall discover a way to measure out a full quart from a one and a half pint box, and an honest peck from a six-quart basket, as well as to turn out an honest package from the faced ones which nobody puts up.

In the investigation of these "ruts commercial" he may, perchance, be brought face to face with the question so long an ogre to the grangers, what share of his income the middlemen may reasonably appropriate, and whether there may not be a better way than to pass his produce through two or more intermediate hands on its way to the consumer; and he may even find occasion to consider whether he or the commission man is the better judge as to what is the most profitable strawberry for him to grow for market purposes.

Nor can he even yet drop quietly down upon the millennial couch of rose leaves, till, after inuring his olfactories to the noisome odors of ruts political or governmental, he shall be able to devise a system of levers with which to lift the onerous burden of purchasing and testing novelties from the too willing shoulders of the pioneer or amateur in horticulture, and deposit it where it properly belongs, upon the shoulders of the many. Nor yet, till he shall succeed in imbuing the mind of the average legislator with the conviction that the great leading ideas or principles which underlie the best practice in horticulture are but a sublimation or intensification of the highest, most productive, and profitable agricultural practice, and that it is, therefore, both profitable and expedient that governmental encouragement, and even direct aid, be extended to horticulture, as the most effective means of elevating the present low standard of agricultural practice and "causing two spires of grass to grow where but one had formerly grown."

CULTIVATING THE BLACK WALNUT.

BY WM. H. RAGAN, SECRETARY OF THE INDIANA HORTICULTURAL SOCIETY.

On page 450, Report of the Department of Agriculture for 1870, occurs the following statement: "In January, 1866, there was brought to New York from the west a walnut tree, 70 feet long, containing 4,600 feet, board measure, which when cut into veneers, 30 to the inch, would be equal to 138,000 feet, worth at 20 cents per foot, $27,000. The estimated cost of cutting, carting, and storing for sale was $700." And again, though I cannot give the author of this item: "A man in Wisconsin planted a piece of land with black walnut, 23 years ago. The land flooded spring and summer and was unfit for ordinary cultivation. The trees are now from 16 to 18 inches in diameter and have been sold for $27,000." As we are all aware, these are exceptional cases, but that walnut lumber now commands from $75 to $100 per thousand feet in this city, and that, too, located as it is right in the midst of former groves of which any country might have been proud, is a fact beyond controversy. But this noble forest is gone, and we, whose immediate ancestors, a stalwart band of pioneers, toiled long and faithfully to remove the almost worthless cumberers of the ground, are to-day carefully engaged in gathering up the once accursed stumps for their commercial value. Not only this, but I to-day stand before this association of farmers, many of whom, like the speaker, have spent weary days contributing to the destruction of these monarchs of the forest, without one word of apology for advocating the claims of this noble tree, as preëminently the most worthy variety for artificial groves and timber belts. Although addressing myself to people residents of a once densely forest-covered region, whose business for a half century has been the destruction of our noble forests, I shall reiterate the warning, "Woodman, spare that tree," and with it urge upon you the propriety of devoting a few spare acres to the cultivation of a walnut grove. I know it has been sneeringly said by our prairie neighbors on the west that they could raise corn and have it manufactured into whisky and glucose, for which they could barter us Hoosiers out of our timber, cheaper than they could raise it. However true this may have been in the past, I am satisfied that it cannot long be practiced, unless we defeat "prohibition," or plant groves at an early day, since we are so rapidly learning the true value of our timber. Before presenting my subject in detail, I will briefly allude to the fact that horticulturists, rather than agriculturists, have been the first to advocate the claims of artificial forestry. This is but natural, since their occupation leads them directly to this result, the propagation and care of young trees being to them a source of revenue, and in view of the fact that their tender and precious crops are more susceptible of unfavorable influences by climatic changes incident to the removal, or partial absence of forests and groves. But after all, the farmer has the greater real interest in this subject. In the first place he has the broad acres on which to grow timber; he, too, is greatly interested in the preservation of moisture and the amelioration of climate incident to the culture of timber; his herds and flocks receive comforting shelter, both winter and summer from his groves, while fuel and timber for his own comfort and profit result therefrom. Having thus briefly argued a few of the points of interest to the agriculturist, in the subject in hand, and assuring you that this is a work that must be begun in anticipation of a period of absolute necessity, if we would provide against a timber famine in the near future, I will proceed to lay before you a few of the many arguments in favor of the black walnut, which in my judgment give it preëminence over all other varieties. In point of quality, as relates to the actual value of the timber, I could not add to the testimonials quoted at the head of this paper. It is doubtful whether any tree of any variety has ever proved of more value than the one cited, and the quality of the timber is such that no fickle whim of fashion can seriously depreciate its value. It is true black walnut is not celebrated on account of its durability when brought in contact with frequent changes from a condition of dryness to moisture, and hence is not so valuable for posts and cross ties as many other species, but for other purposes, from the finest parlor decorations to the external finish of the roughest out-buildings, it stands without a peer.

It is indigenous to our soil and perfectly hardly, not requiring acclimation; it is comparatively free from the attacks of depredating insects; it grows rapidly into a tree of noble proportions. In the economy of its nature it gathers from the elements, and annually deposits through its decaying foliage, bark, etc., a fund of wealth to the soil, that has, in Hoosier parlance, conferred on it the title of "witness tree," it being regarded as a "witness" to good soil. It bears at an early age, and annually thereafter, full crops of nuts, that even now possess a commercial value, equalling if not excelling the average value of a grain crop, and in this particular, if in no other, yielding a yearly income far above that of most if not all other trees that have been recommended for artificial forestry.

HOW TO PLANT AND CULTIVATE.

All nut-bearing trees are difficult to transplant. This is due to the fact of their invariably starting from the germ with a strong radical or tap-root, which is apt to be seriously cut back in digging. On this account nurserymen avoid the culture, and especially the recommendation, of nut-bearing trees. One of the principal elements of popularity of the Catalpa Speciosa, and one, no doubt, which prompts many fabulous statements concerning its extreme durability, is due to the ease of propagation and facility and almost absolute certainty of success attending its transplanting. This has also given unmerited reputation and prominence to numerous other trees of far less value than the black walnut, or even the Catalpa Speciosa. But, fortunately, what would be an objection to the black walnut when viewed from the nurseryman's standpoint, that of self-interest, is really one of its desirable qualities. It is not necessary that you should have your trees furnished ready made by other parties. You can grow your own black walnuts, and that too without risk of loss or the back-aching labor of transplanting. Prepare your ground by breaking and harrowing in the fall. Furrow it off each way as you would for corn, except that the rows should be about seven feet apart. Take the nuts fresh from the trees, it is not necessary that they should be hulled, placing two nuts in each crossing. This is to insure getting a good stand. The nuts should be covered very shallow, just enough earth to hide them. In the spring the land should be furrowed midway between the rows of nuts, and the spaces planted with corn or potatoes. Cultivate as you would a corn crop by cross plowing, being careful to give the young trees a fair chance and good clean culture. The second spring thin out your plants to one tree to the hill. If there are spaces entirely missing, they may be filled by transplanting from the hills containing duplicates. The second and perhaps the third year it will pay to cultivate corn between the rows, after which the trees should be regularly cultivated until they fully occupy the ground so as to keep down by their shade all weeds and grass. The period at which cultivation may be discontinued cannot be definitely stated, as much will depend upon the character of the seasons and quality of the soil. Of course seven feet each way will be too close for permanent trees, but as they will protect each other when small and make much better growth, it is preferable to have them closely planted. When they begin to crowd the alternate trees in each row may be removed. The trees thus removed will be of sufficient size to be useful in various ways on the farm. A second thinning will in a few years be necessary, taking the alternate trees the other way. Your permanent trees will now stand fourteen feet apart each way, a sufficient distance for a number of years, though not for large trees, but the thinnings will always pay a large per cent on the value of the ground occupied. I shall not weary your patience by an array of figures to convince you of the profitable value of an acre of black walnut timber at a given age, but only remark that at fourteen feet each way you would have something over two hundred trees, and that trees that have grown without culture within my recollection, and I am not yet fifty years of age, will now readily bring five dollars each, and that such trees are sought after with diligence and are being shipped from every railroad station in Central Indiana. I will now close this paper, already too long, with the prediction that he who plants a walnut grove, caring for it afterwards, will leave to posterity a richer inheritance by far than the man who buys and sells on margins.

PRUNING THE GRAPE.

BY L. B. PIERCE, PORTAGE COUNTY, OHIO.

The grape vine is preëminent among climbing shrubs for the abundance of its watery sap, the size of its leaves, and the vigor of its growth. A native of moist thickets, its early life is a struggle for existence, and many years sometimes elapse before its leaves bathe themselves in the free sunlight above the tree tops. When once this period of its existence is reached the wild grape vine runs riot as if intoxicated with success. The vigor which was so necessary in its youthful combat with opposing forces, is not lessened by free contact with the dews of heaven, and it continues to push forward the thrifty shoots in every direction, until those wonderful canopies of foliage are formed which so often arrest the attention of the country traveler. These luxuriantly beautiful bowers rarely hide much fruit. That which is the glory of the cultivated vine, the clusters of purple and gold, is wanting. In its rampant pushings and untrammeled wanderings it has dissipated its strength and found but little time for the perfection of anything but leaves. "Nothing but leaves" is too often the refrain which the autumnal winds sing as they pass from one to another of these splendid monuments of nature's prodigality. To turn this prodigality into channels of usefulness is the work of the vine-dresser. Having selected a vine whose fruit is an approach toward the ideal, he cuts a single ripened bud, and by the application of heat and moisture he furnishes it with roots, and thus not only saves years of time, but preserves the variety in its purity. The result of one season's growth of a rooted grape bud is a slender vine, depending for its size upon the vigor of the variety and the length and favorableness of the season. While a weak vine in a poor season will not mature more than five or six buds, a strong one under favorable circumstances may ripen a hundred. After a young vine has ceased its first season's growth and before it commences the second is the time to begin to prune. As the object is fruit and this as soon as possible, we must work with this in view. The bud from which the vine was grown possessed within itself the rudiments of three or four clusters of grapes, and had it remained upon the parent vine the sap from the parent root would have developed the fruit, but severed it had vigor sufficient to sustain its own life, but none for the immediate propagation of its kind. To accomplish this the energies of the young vine must be conserved for a year or two. To allow all the buds which the young vine possesses to grow would fritter away its strength and produce a multitude of little buds of no fruit-bearing value. We, therefore, on some fine winter's day, cut away all the wood save that which bears the three lower buds, and then in May, when these have commenced to grow, quietly pinch off two of these, leaving only the strongest one. The sap from all the roots is thus concentrated in the growth of one bud, and the result is a strong, vigorous shoot whose buds frequently attain sufficient strength to bear fruit the following season. But just here we have another problem to solve of more immediate importance than fruit bearing. The grape vine is not self supporting. In its wild state the young vine is fain to lean upon the frail stem of the aspiring Rattleweed, and when this, brittle with decay, is blown by the wintry wind against a Spice bush or Witch Hazel, the vine accepts the inevitable and clings to the new support. But our vine is the creature of civilization and clean culture, and in pruning we have to bear in mind the necessity of its being supported. This is generally and at the same time most economically done with a wire trellis, and to prepare and adapt the vine for its support is the object of the second year's pruning. At the winter pruning the strong shoot which was the result of the second summer's growth should be cut back to about two feet in height. In the following April, when it is certain that the two upper buds are alive and vigorous, all below them should be rubbed off and the summer's growth confined to the production of two strong canes from the upper buds. If the season is favorable the result will be that all the buds for several feet on this new growth will be fruit-producing buds. The winter's pruning for the third year consists in shortening the two new shoots to the desired length, which should be one-half the distance between the vines. These two shoots which we have now obtained are to be the future branches of the grape vine which we have been growing. We bend them in opposite directions down to a horizontal wire and attach them in such a manner that each arm will form an arch, with the center of the arm five or six inches higher than either end. This is done to arrest the flow of sap and cause all the buds to start alike. These buds produce the bearing canes and should not be allowed nearer together than ten or twelve inches. Each of these canes will produce three bunches of grapes, and an indefinite amount of growth of vine beside. This has led to summer pruning, which consists of lopping off the young growth after it has grown a few feet, with a view to forcing the sap into maturing and enlarging the fruit. I wish to say a word upon this topic before I close, but I will first finish the subject of winter pruning. We have now got our vine into bearing and its annual pruning consists of cutting back their bearing canes to their lowest bud. As a shoot grows about an inch before it forms a bud, each pruning leaves the spur a little longer until in a few years an unsightly mass of wood cumbers the arms of the vine. These can be cut off near their base and a new cane allowed to grow from a dormant bud at the base, but this growth will generally be too feeble to produce fruit before the second year. This system of pruning is, I believe, the simplest and in many respects the best of any close or short pruning system in vogue. It is just as applicable to vines upon buildings and arbors as to those upon trellises, and there is no excuse for the rambling, many stemmed monstrosities which many people tolerate upon their houses and the trimming of which they inflict upon some long-suffering, grape growing neighbor. I have said that I consider this system the best of its kind, but at the same time I wish to say that I do not believe in close pruning. There cannot be but a shock to the constitution of a vine by semi-annually reducing the top out of all proportion with the roots. I notice that the advocates of summer pruning are not nearly so numerous as they were a few years ago, and but little severe summer pruning is now done. There is, however, no doubt that the rampant growth of vine during the latter part of summer is often seriously detrimental to the growth and flavor of the fruit, and a method of pruning which would check and control this growth without the wholesale slashing of summer pruning is greatly to be desired. As I have intimated before, I have long had a theory upon this subject, and as I do not know of a better way to get it before the public, I have concluded to inflict it upon the same kindly forbearance which has so often tolerated my lengthy dissertations. We will suppose that the vine has reached its third year and is provided with arms for the production of bearing canes. Now, instead of growing a shoot once in twelve inches, I would let one start at every bud or once in six or seven inches. Every alternate cane I would allow to produce fruit, while from the others I would remove the clusters as soon as they appeared. On the succeeding year I would allow three buds to remain on the canes which produced no fruit, while I would cut those which bore the fruit back to one bud and allow no fruit to grow upon the cane which sprang from that bud. The three buds which were left upon the other canes would of course produce fruit-bearing laterals. When the clusters were sufficiently developed I would remove all but one cluster from each lateral, and thus while the vine was producing no more fruit than under the old system, this would all be upon laterals, which from their recumbent position would have a tendency to check redundant growth of foliage. At the same time the sap and growth would be distributed through four times the number of buds, and the effect would be to retard the production of wood and more thoroughly mature both wood and fruit. Without going farther into the subject of grape vine pruning, I will leave it with the remark that I believe that the true system will eventually be found in something similar to what I have prepared.

AN ANTISEPTIC CALLED "OZONE."

BY PROF. R. B. WARDER, OF CINCINNATI, OHIO.

During the latter part of 1881 and nearly all of 1882 the secretary has been receiving communications upon an antiseptic advertised for a time in a great many American newspapers as "ozone." These were answered briefly by requesting the inquirers to beware, for there was certainly a measure of humbug in the announcement; and just how much would certainly appear after a short time. Early in this year a paper was received upon this very subject, prepared by Prof. R. B. Warder of Cincinnati, Ohio, and read before the Ohio Mechanics' Institute. Upon request several copies were sent for distribution in our State. In order, however, to bring it before our horticulturists in every part of Michigan, that the facts concerning this antiseptic may become theirs, it is inserted in our volume for 1882.

The following is the complete text of the paper:

The attention of the Institute has already been called to the claims of the "Prentiss Preserving Company," and to their exhibit of meats, fruits, etc., which were said to be preserved by the antiseptic action of ozone. While it is not the purpose of the author either to recommend or to decry any particular business, some reference to the advertisers of ozone is unavoidable. The claims of the company are briefly expressed in the following words from their advertisement: "Ozone—a new process for preserving all perishable articles, animal and vegetable, from fermentation and putrefaction, retaining their odor and flavor." "This preservative * * * * is simply and purely *Ozone*." The material sold is a dark powder, which is put up in packages of about one pound each. This substance is burned in an air-tight chamber, in which the articles to be preserved are placed. The gas formed by combustion is the real antiseptic, which is called ozone, but the same name is applied also to the original powder. The visitor who inspects the eggs and meats exhibited by the Prentiss Preserving Company is readily persuaded that they use a real antiseptic, and that their claims are at least partly true. The chemist who is asked to believe that ozone is produced so cheaply must feel that his credulity is severely taxed.

The first inquiry which reached me was from Mr. H. C. Freeman, of Illinois, whose habits of practical observation led him to believe that the powder consists of sulphur disguised with charcoal and cinnamon. Dr. E. Osmond, of this city, had reached nearly the same conclusion; and he compares the Prentiss method with "Shourd's New Dominion Process" (said to have been patented in Ontario Nov. 9, 1868), which depends simply on the fumes of burning sulphur. My own examination led to the following results: The so-called "ozone" is a powder, nearly black, perfectly dry and tasteless, but with a very distinct odor of cinnamon. It contains numerous light brown particles (under $\frac{1}{2}$ millimeter long), which seemed to be ground cinnamon bark. The powder burns with a blue flame, emitting pungent fumes (which constitute the real antiseptic agent), and leaving black crusts, which also can be consumed by the aid of sufficient heat. It repels moisture and is not readily wetted.

This substance consists essentially of sulphur and carbon. The percentage of the former constituent was estimated by oxidation with nitric acid and potassium chlorate, evaporation with hydrochloric acid, and precipitation with barium chloride. The fixed carbon was estimated approximately by coking in a porcelain boat, within a closed tube, and deducting the ash and the traces of sulphur which remained in the boat. Actual combustion of the carbon was thus prevented, as the air was quickly driven out by sulphur vapor; but there may have been a small loss of carbon as sulphide. Traces of bituminous matter appeared to be driven out with the sulphur, making black stains on the walls of the tube. The moisture was estimated by heating at 100° Centigrade to constant weight.

Qualitative tests for other volatile inorganic bodies, as ammonium salts, iodine, and mercury, gave negative results.

The general results of the analysis are tabulated as follows:

Moisture (including any volatile oil)	.26	per cent.
Sulphur	93.67	" "
Fixed carbon	4.63	" "
Loss, and carbonaceous matter expelled at a red heat	1.35	" "
Ash	.09	" "
Total	100.00	" "

In an attempt to separate the carbon and sulphur by dissolving the latter in carbonic sulphide, only 66.80 per cent of the substance was removed, while at least 80.0 per cent of the residue was found to be sulphur. It is not likely that so large an amount of the "insoluble modification" of sulphur is present, but that it is mechanically protected by the carbon. This view is also supported by the microscopical examination.

Under a magnifying power of fifty diameters, and with reflected light, the powder is clearly seen to have the form of botryoidal clusters, of an iron-gray color. The spheroids are of nearly uniform size, closely resembling flowers of sulphur, except in color. A few patches that have escaped the general blackening are of a beautiful yellow; and here the resemblance is complete. Any one who will examine the "ozone" powder and flowers of sulphur side by side under a suitable low-power microscope, will find the appearance very characteristic. When the powder is crushed it becomes much lighter, as the spherules are broken and the pale color within is revealed. The carbon, then, is not simply mingled with the sulphur, but is made to adhere to its surface. With a magnifying power of 220 diameters, in bright sunlight, minute black particles are seen upon the yellow background. Lampblack is very finely divided carbon, and this is probably the most available form of carbon with which to disguise the sulphur. It thus appears that the "ozone," as sold, consists essentially of about nineteen parts of flowers of sulphur mixed with one part of lampblack, and scented with ground cinnamon or something closely resembling it.

A sample of distilled water which had been subjected to the Prentiss process was found to be perfectly clear and colorless, with a very distinct smell of sulphurous acid. It had a mildly acid taste, with distinct acid and bleaching reaction on litmus; it reduced potassium permanganate and potassium bichromate, destroyed the blue color of iodide of starch, liberated iodine from potassium iodate, gave a blue precipitate when added to a mixture of potassium ferricyanide and ferric chloride, and yielded sulphuretted hydrogen by the action of zinc and dilute acid. These reactions confirm the presence of sulphurous acid, an active reducing agent, and most conclusively exclude the presence of ozone. A volumetric estimation with potassium permanganate showed the presence of about one-half volume of sulphurous anhydride to one volume of the solution.

Having thus shown that sulphurous anhydride is the chief constituent of the antiseptic gas used in the process described, we may consider three practical questions bearing upon its value:

1st. Are its claims as an antiseptic to be trusted?

2d. Are the foods preserved in a normal condition, with their proper odor and flavor?

3d. Is this preparation superior to pure sulphur, or to a cheap mixture of the substances of which it seems to be prepared?

A complete answer to the first question would require a series of varied experiments, extending, at least, over some months; while the conditions must be under the control of the experimenter during the whole time. Such experiments I have not made. The testimony of interested parties who use sulphurous anhydride, and distinctly advertise that it "is simply and purely ozone," must be received with all the caution required in such cases, by the ordinary rules of evidence. The antiseptic properties of sulphurous anhydride, however, are well known. Hundreds or thousands of the test packages of the Prentiss preparation are sent out daily, and thus the process is subjected to practical tests by numerous consumers. If the claims made are too sweeping, they may still contain a large share of truth. It must be admitted, however, that the antiseptic action of sulphurous acid (like its bleaching action) is said to be more transient than that of some other chemicals. A series of experiments in which chlorine, nitric oxide, and other oxidizing agents are compared with sulphurous acid in the permanence of their antiseptic action, may lead to interesting results.

I may add that dilute solutions of tartaric and gallic acids were prepared, one portion of each being subjected to the Prentiss process; these remained quite clear for two months, while flocks of organic growth were observed after a few days in the portions that had not been so treated.

But the mere absence of fermentation and decay is not sufficient to ensure the preservation of articles in their normal conditions. A mummy resists decay for thousands of years. Even in packing-houses, where eggs are kept near the freezing point, they suffer gradual evaporation—the air bubble enlarges at the expense of the fluid contents; and if an egg which can resist decay is kept during the heat of summer, it may require close watching to prevent it from drying up and becoming unsalable. I would recommend, for summer storage, that one or more lots be carefully weighed from week to week, in order that the owner may detect any marked diminution of weight in time to save himself from serious loss. The same principle applies to meat. The shipper or dealer must not merely guard against actual shrinkage in the weight of his stock, but rather he must watch whether it becomes hard, dry, and insipid, losing its juicy freshness. The danger is still greater with some kinds of fruits and vegetables; and if these are kept under water (or solution of sulphurous acid), some of the soluble constituents, to which the delicate flavor is due, must inevitably be removed by diffusion. A single rain will materially alter the chemical composition of a crop of hay. How, then, can we hope for the delicate flavor of a tomato, or green corn, after a month's soaking; While the claims of perfect odor and flavor are evidently quite too sweeping, yet such considerations may possibly lead us to overestimate these inconveniences. The demands of the great public do not recognize that there are pears of more delicate flavor than the Bartlett, or that green corn when first gathered is far superior to that usually sold in market. While all existing modes of preserving food from one season to another are more or less inconvenient, or imperfect, the Prentiss method also must be subjected to the test of experience, and abide by the verdict of a discriminating or indiscriminating public, as the case may be.

If sulphurous acid or the Prentiss preserver proves to be of any value, the thanks of the public may be due to the Prentiss Company for the part they have taken in making the antiseptic properties of this substance more widely known. But men of practical business tact will doubtless attempt an improvement on the Prentiss formula, by further experiments with the combustion of sulphur. It is desirable so to regulate the heat generated in the combustion that the vaporization of unburnt sulphur shall be avoided, and that the contents of the chamber shall not be scorched. The thin coating of carbon, which is spread over the surface of the more inflammable sulphur, may contribute to this end; but that will be readily imitated, if it is found needful to do so.

In conclusion, first, the antiseptic gas stated to be ozone is chiefly sulphur dioxide, the exact value of which still remains to be proved; second, this is not the only antiseptic; third, the use of sulphurous acid as an antiseptic is not new; fourth, sulphur becomes extremely expensive when purchased under the name of ozone at $1 to $2 per pound.

THE RATIONAL METHOD OF TREE PRUNING.

A PAPER READ BY N. H. EGLESTON, OF WILLIAMSTOWN, MASS., BEFORE AMERICAN FORESTRY CONGRESS.

In this new world little attention has been given to the pruning of trees. With our ample domain, giving space for all the trees, we have left them to grow as they might. Our pruning, where it has not been of that heroic and decisive sort which lays the axe at the roots of the trees and cuts them to the ground, has been of a hap-hazard kind, based upon no system and directed by no science. Each one has cut and trimmed according to his own notion or whim. If the limb of a tree has been in the way, become an obstruction to the walk, or intercepted some desirable lookout, it has been lopped off, usually by whatever instrument convenience would supply and in a manner to require the least exertion. Tree-growers and the better class of farmers have been somewhat more painstaking in their methods. They have removed or shortened limbs with some study of after effects, and have so performed their work as to secure if possible the proper healing of the wounds which they have made. But in most cases the trees have been left to themselves or have been lopped with reckless carelessness. It seems to have been generally thought that they would bear any amount of mishap and the utmost severity of treatment. They have been regarded rather as dead than living matter, and their delicate and sensitive organizations, instead of being guarded and protected with sympathizing care, have been left to be the prey of neglect and violence.

The result has been that many of our forest trees have fallen victims to decay when proper pruning would have ensured their healthy growth to full stature, and many trees planted by the roadside or the dwelling for the purposes of shade or ornament have become deformed and short-lived in consequence of improper pruning.

With the rising interest in trees and tree planting in America the importance of pruning and its proper method ought to receive attention as a branch of forestry. The object of pruning trees, forest trees especially, is to secure the largest and healthiest and therefore the most profitable growth of timber upon any given area of ground, and experience has shown that by a rational system of pruning a forest may be made to yield a much larger product than when left to itself, as is ordinarily the case with us.

Hitherto there has been no adequate treatise on the subject of tree pruning in the English language, and we have been excusable for our ignorance of the subject. The Germans and the French, in advance of us in other departments of forestry, are also in this. The advantages of pruning forest trees, as promoting an increase of timber, were recognized in Germany two hundred and fifty years ago. But the practice of pruning fell into disuse after a time, until it was revived during the present century by the writings of De Courval and Des Cars, who recommended a system of pruning based on the fundamental laws of vegetable physiology, and which is now adopted in all the continental forests. The work of Des Cars, entitled "A Treatise on Pruning Forest and Ornamental Trees," has recently been translated from the French of the seventh edition by Professor Sargent, of Harvard University, and published by the Massachusetts Society for the Promotion of Agriculture. It is essentially a reproduction of the larger treatise of De Courval in a brief and more popular form, it being a duodecimo volume of less than one hundred pages.

The system of these writers is based on the fact that "as wood is alone formed by descending, elaborated sap, a wound made on a tree can only be recovered with healthy, new wood, where its entire circumference is brought into direct communication with the leaves by means of the layer of young and growing cells formed between the wood and the bark." To make this connection it is necessary to prune in such a manner that no portion of an amputated or dead branch shall be left on the trunk. The cut should always be made close to and perfectly even with the outlines of the trunk, without regard to the size of the wound thus made. This is the essential rule in all pruning, and on its observance the success of the operation depends. "A tree entirely left to itself," says Des Cars, "generally develops in one of two directions. It does not grow upwards, but assumes the low, round form common to the apple tree; the lower branches grow disproportionately large and absorb too much sap, to the detriment of the top of the tree, and these long heavy branches are often broken by the wind, or by snow and ice, leaving hideous stumps. Trees of this form are very common. They generally decay at the top before reaching maturity and have little commercial value. On the other hand many vigorous trees grow disproportionately at the top, the lower branches die from insufficient nourishment, fall off, and leave, when large, bare decayed spots, which gradually penetrate to the heart of the tree, and ruin also its commercial value. Wounds caused by the breaking off of large branches by wind or snow produce the same results. There is no remedy for the dangerous effects of such accidents except in pruning. It is a simple question of surgery. Without pruning the tree must sooner or later decay; with pruning its value may be preserved. The secret of obtaining a complete cure in all operations requiring the removal of a branch, either living or dead, consists *in cutting close to and perfectly even with the trunk*." And it matters not how large the cut may be. This is a universal rule of action, and it is based on the fact that new wood and bark are formed by the descending sap which passed down between the old wood and the bark and cannot deposit the new woody substance upon the scar of the pruned branch if it is left projecting at all from the line of the sap vessels in the trunk, but where the cut is made even with the trunk it is soon covered with the new woody fibre and bark, and the tree grows on to maturity with unimpaired vigor and soundness. If the limb amputated is large the wound will not heal over completely in a single season. The new wood will form first around the top and sides of the wound, which will soon be completely surrounded by the new growth. Meantime to prevent decay taking hold of any portion of the wound it has been found well to cover the wound with something which will protect it. For this purpose coal-tar, a waste product of gas works, has been found superior to the many other preparations which have been used. It has remarkable preservative properties and may be used with equal advantage on living and dead wood. A single application forms an impervious coating to the wood cells. It produces a sort of instantaneous cauterization and preserves from decay wounds caused either in pruning or by accident. Its odor drives away insects or prevents them from injuring the wood while the wound is healing. After long and expensive experiments the director of the parks of the city of Paris has adopted this in preference to all other means of protection. It may be applied with an ordinary paint brush, and one coat is sufficient for wounds of ordinary size. When they are exceptionally large a second coat may, after a few years, be advisable.

If leaving any portion of an amputated or broken limb endangers decay in the tree and lessens its value for timber, to allow a portion of one or two feet in length to remain, as is often the practice, is much more disastrous. These stumps, cut off from communication with the leaves, the lungs, of the tree, die, "the bark falls off, and the stumps remain like plugs of decaying wood driven into the trunk. In a few years the stumps rot, and decay penetrates to the heart of the tree." Such a tree is soon greatly injured if not destroyed as a timber tree, when a little time spent in judicious and rational pruning would have continued its life for half a century perhaps and added greatly to its commercial value.

By the system of De Courval and Des Cars, forest trees are so shaped from time to time by pruning that healthy trunks are carried up to a greater height than would otherwise be the case, thus adding to their value as timber, while more room for a remunerative undergrowth of coppice is thus given and the total product of the forest greatly increased. In the practical application of the system it is held that the class of young forest trees, that is those less than forty years old, should be so pruned of their lower branches that the trunk will equal one-third of the entire height of the tree, and the head should be elongated ovoid in form, the lower branches left being more or less shortened in for this purpose. Middle-aged trees, or those between forty and eighty years of age, should have thin trunks, equal to about two-fifths of the total height and the head should be made to assume a somewhat rounder form than that given to the younger trees. In the old trees, eighty years and upwards, the trunk should nearly equal one-half the total height, and the head be still more rounded, and at all times decaying and dead branches should be carefully removed.

Such, without undertaking to go into the minute details of operation, is the system of De Courval and Des Cars. It commends itself at once as a rational system, and ample experience in Europe proves its great value. It is simple and intelligible and may be put in practice successfully by any one. The Massachusetts Society has made a very important contribution to practical forestry in securing the translation and publication of Des Cars's treatise.

THE ANNUAL FAIR OF 1882.

PRELIMINARY WORK.

With a view of ascertaining the condition of the Michigan fruit crop and getting statistics that would not only be valuable to fruit-growers and shippers, but indicate what amount of work would be required to get ready for the fair, about the first of August the Secretary sent out 100 postal cards in envelopes to the most prominent fruit-growers in Michigan, asking them to return the percentage of an average crop that the orchards and vineyards promised for the crop of 1882, with such remarks as would naturally be suggested by the questions enclosed.

By August 14th the returns were nearly all in and the following is an abstract of the bulletin issued by the Secretary:

Only one correspondent puts the apple crop at a full average, while 34 place it at less than one-fourth of a crop; 50 reports make it less than one-half a crop, and 75 less than three-fourths of an average yield. The following localities have the most promising show of apples: Ingham, Bay, western Muskegon, Manistee, Genesee, Allegan, Macomb, Lapeer, western Cass, western Kent, central Barry, and eastern Ottawa; all unite in the statement that the fruit will be imperfect, scabby, and badly injured by insects.

The crop of pears promises better than apples, and unless some new difficulty arises there will be 75 per cent of a full yield. There is less blight this season than for several years, judging from reports to date.

Peaches in unfavorable localities for this fruit are a complete failure. Upon high ground in the interior there will be above half a crop, and upon the reliefs of Washtenaw county even better than this; while upon the lake shore to the north there will be a light yield, of say 40 per cent. In Allegan, Kent, Ottawa, and Muskegan there will be two-thirds of a crop and the fruit very fine. In Van Buren and Kalamazoo about half a crop.

The most prolific fruit in Michigan this year is the grape. There are promises of a very full yield if the season is prolonged so the clusters will ripen. Many of the first setting were killed by frost. There is some mildew appearing in several localities, and the recent wet weather has developed some tendency to rot in places where this disease has appeared years before.

The plum crop will be a good average where persistent efforts have been made to fight the curculio.

The peach yellows is gradually working northward. A few "sporadic cases" have been announced as far north as Ottawa and Kent; but there is a united feeling among peach-growers that every case must be stamped out at sight.

There are a great many theories concerning the cause of failure of apples. It is laid to east winds, frosts, moist weather at time of blossoming, etc. The most common explanation seems to be that the continuous frosts through May weakened the vitality of the young fruit so that it dropped through June. The varieties of apples that have as yet hung on the trees best are Baldwin and Golden Russet. Fall apples seem to be almost a dead failure. The Northern Spy, which is a great favorite in our State, will be represented by very small quantities in the fruit cellars next winter. Cider, apple jelly, and evaporated apples will be reduced to a minimum.

To the lovers of apple sauce I would counsel the selection of the best substitute in the way of canned fruit that is possible, and begin early.

With this kind of a showing in what was expected to be the prolific fruit year, little was anticipated in the fruit department of the autumn fairs. Several collectors that usually make large exhibits went into the field the week before the State Fair and gave up in despair, saying: "There is no use; no good specimens of apples are to be found." But with all the unfortunate circumstances we had a magnificent show in Pomological Hall, and what was lacking in fruit was made up in plants and flowers.

The fair was held in the city of Jackson September 18th to 23d, inclusive. The hall given to fruits on these grounds is dark and damp on account of the dense shade; but chairman Gilbert of the Business Committee, by putting in additional sky-lights and brightening up the walls, did everything in his power to make things pleasant for our Society in the exhibition.

THE FRUIT EXHIBIT.

The exhibit of fruit occupied 2,000 feet of shelving, and in all there were 2,800 plates. In apples there was not the usual hight of color or freedom from blemishes. However insect marks were rare, for Michigan exhibitors of fruit have been taught to "leave the worms at home." The show of pears was very fine in some varieties that are usually ripened and gone at this season. The peaches were the glory of the fruit show. They were shown in abundance and in excellent variety. In plums Oceana county was not alone this year, for Mason county at the last hour bethought herself of the State fair, and sent down a fine lot of plums. The grapes were few and scattering, all because the prominent varieties were not even colored yet. However, Mr. Wm. Rowe showed beautiful clusters of the Prentiss and Mr. J. S. Woodward exhibited the Niagara in abundance. Both of these varieties, being what are popularly termed white grapes, although they were not fully ripened, made delightful exhibits. The canned, preserved, pickled, and dried fruits were exhibited in large quantities from all parts of the State.

PLANTS AND FLOWERS.

A few days before the fair opened the large platform in main hall was offered the horticultural society upon the express condition that the whole of it should be covered with plants and flowers so arranged as to give it the best possible effect. Mr. Gibson, our superintendent, accepted the offer and immediately appealed to Jackson florists to aid him in making the finest exhibit of plants ever shown at a State fair in Michigan. Messrs. Hibbard and Brown and Mrs. Andrews all responded by bringing their choicest plants; and in a day's time at the opening of the fair, all submitted that Mr. Gibson and the florists had faithfully carried out their part of the contract for the horticultural society. A mishap the first day, by which Mr. Hibbard's exhibit was thrown into a mass by the falling of the stage, was quickly repaired by the united exertions of all concerned, and from first to last one of the most admired features of the fair was the plant exhibit. Prof. Tracy, an expert in tasteful arrangement of plants remarked that it was very rare to see as good taste displayed as he noted in the combinations of forms and colors upon this stage.

As if to add cream to this exhibit, Mr. John Gilbert, of the Business Committee, erected just opposite it in the center of main hall a summer house all of green, which was the embodiment of exquisite taste.

To be sure the fruits and flowers should be together, but it was impossible to secure this desirable combination with the arrangement of halls at Jackson. But the fruits were not without their floral embellishments, for Wm. M. Bennett, of Jackson, a very successful amateur florist, made a capital display from his gardens; and Mrs. John Murray also brought of her choicest house plants, all of which were shown in fruit hall.

THE VICK EXHIBIT.

For years there was not an issue of our annual premium list without a generous offer by James Vick, of Rochester. Now that he has closed his earthly labors and we cannot rely upon him longer to stimulate our lovers of flowers to their best endeavors in floriculture, we are glad that his sons pick up the threads of his undertakings and are to perpetuate his memory by still urging the people by precept and example to cultivate choice flowers about their homes, thus adding to the pleasure of living in this world by the employment of the best things found in it. Some days before the fair we were notified that the firm of James Vick would make an exhibit at our fair if space could be allowed for the purpose. The center space in our hall was given for this display, and when put in place by Mr. E. Coleston Vick, it proved to be a most admirable collection. A continuous throng of people were about the Vick display throughout the fair, and at a meeting of our Executive Board a vote of thanks was given to Mr. Vick, and an award of the diploma of the society made for the excellent display.

OFFICERS AND COMMITTEES.

President Lyon had charge of the nomenclature of the fruit exhibit. His corrections were not made, however, in the interests of competitors, as committees were instructed to make their awards upon the name given by exhibitors. The correction of names is made a feature of the fair for the purpose of educating people to know fruits by their correct names.

J. N. Stearns, of Kalamazoo, was general superintendent of fruit hall. W. K. Gibson, of Jackson, had in charge the entire plant and flower exhibit of the fair. John Abbott, of Lapeer, officiated as superintendent of the general collections of fruits. James Satterlee, of Greenville, supervised the arrangement of special exhibits. Evart H. Scott, of Ann Arbor, looked after the single plates, and S. M. Pearsall superintended the divisions of canned, pickled, and dried fruits and jellies.

The viewing committees in each division were appointed by the superintendent in charge and the president of the society; and the superintendent according to rule was secretary of the committee. Mr. Abbott had to assist him, S. O. Knapp, of Jackson, and F. H. Parker, of Eaton Rapids. Mr. Satterlee's co-workers were R. W. Judd, of Jackson, and Wm. Rowe, of Grand Rapids. Mr. Scott's associates were Wm. A. Brown, Stevensville, J. S. Woodward, Lockport, N. Y., S. S. Rockwell, Jackson. Mr. Pearsall's committee were E. Graham, Grand Rapids, and Mrs. Alice Abbott, of Lapeer, assisted a portion of the time by Byron S. Ashley, of Jackson, and E. Graham, of Grand Rapids. Mr. Gibson selected for viewing committee on plants and flowers, E. Coleston Vick, Rochester, N. Y., James Cassidy, Agricultural College, Lansing, and Mrs. Alice R. Garfield, Grand Rapids. The president selected a special committee consisting of Eli Bidleman, Lansing, and Peter Collar, Adrian, to award the premiums upon nursery stock.

THE ENTRIES AND EXHIBITORS.

There were 1,200 entries in our department of the fair, the same number as last year. The following is a complete list of exhibitors, together with the postoffice address of each:

No.	Name.	Postoffice.	County.
1	Adams, L. C.	Horton	Jackson.
2	Andrews, Mrs. Dr.	Jackson	Jackson.
3	Bissell, Mrs. H.	Jackson	Jackson.
4	Baur, Emil	Ann Arbor	Washtenaw.
5	Brown, W. A.	Stevensville	Berrien.
6	Brown, Alex.	Jackson	Jackson.
7	Beebe, H.	Ludington	Mason.
8	Bennett, Wm. M.	Jackson	Jackson.
9	Bartholemew, J. A. & H.	Vanessa	*Ontario.*
10	Bragg, L. G. & Co.	Kalamazoo	Kalamazoo.
11	Berrien Co. Hort. Society	Benton Harbor	Berrien.
12	Bartlett, Mrs. M. E.	Tompkins Center	Jackson.
13	Blowers, J. M.	Lawrence	Van Buren.
14	Conklin, Dr. A.	Manchester	Washtenaw.
15	Cook, Mrs. R. M.	Charlotte	Eaton.
16	Clark, Mrs. R. E.	Jackson	Jackson.
17	Cornwall & Potter	Jackson	Jackson.
18	De Puy, Minnie	Jackson	Jackson.
19	Doney, Belle	Jackson	Jackson.
20	Dorr, S. W.	Manchester	Washtenaw.
21	Durham, Mrs.	Ludington	Mason.
22	Drew, Mrs. Jno. F.	Jackson	Jackson.
23	Emmons, Mrs. D. K.	Byron Center	Kent.
24	Fish, Eli	Tompkins Center	Jackson.
25	French, ———	Ludington	Mason.
26	Grand River Valley Hort. Society	Grand Rapids	Kent.
27	Graham, E.	Grand Rapids	Kent.
28	Gibbs, C.	Ludington	Mason.
29	Gibson, Mrs. W. K.	Jackson	Jackson.
30	Gulley, A. G.	South Haven	Van Buren.
31	Garver, D. L.	Hart	Oceana.
32	Howard, D. W.	Pentwater	Oceana.
33	Hibbard, W. R.	Jackson	Jackson.
34	Harrington, B.	Jackson	Jackson,
35	Helme, J. W.	Adrian	Lenawee.
36	Jenkins, Nellie C.	Jackson	Jackson.
37	King, Mrs. B. F.	Jackson	Jackson.
38	Kellerman, B.	New Buffalo	Berrien.
39	Lowell, Mrs. J. C.	Jackson	Jackson.
40	Lincoln, L. C.	Greenville	Montcalm.
41	Lyon, T. T.	South Haven	Van Buren.
42	Lewis, Mrs. F. J.	Michigan Center	Jackson.
43	Matteson, Mrs. R. R.	Jackson	Jackson.

No.	Name.	Postoffice.	County.
44	Murray, Mrs. John	Jackson	Jackson.
45	Merriman, Mrs. Mary	Jackson	Jackson.
46	Markham, W. B.	Shelby	Oceana.
47	McClatchie, G. C.	Ludington	Mason.
48	Mason County Pomological Society	Ludington	Mason.
49	McClary, Gertie	Galesburg	Kalamazoo.
50	McNaughton, R. T.	Jackson	Jackson.
51	Merritt, Mrs. J. F.	Jackson	Jackson.
52	Nutten, George	Moscow	Hillsdale.
53	Nabors, Nellie S.	Flint	Genesee.
54	Nabors, L. E,	Flint	Genesee.
55	Overholt, W. H.	Mason	Ingham.
56	Overholt, Mrs. W. H.	Mason	Ingham.
57	Olds, A. A.	Decatur	Van Buren.
58	Owen, Jane P.	Adrian	Lenawee.
59	Owen, Dr. W.	Adrian	Lenawee.
60	Oceana Co. Pomological Society	Pentwater	Oceana.
61	Parsons, Philo	Detroit	Wayne.
62	Purdy, M.	Ludington	Mason.
63	Prentice, Mrs. Wm.	Windsor	*Canada.*
64	Purves, J. H.	Jackson	Jackson.
65	Parshall, J. J.	Ann Arbor	Washtenaw.
66	Peck, J. N.	Jackson	Jackson.
67	Ranney, Mrs. D. H.	Jackson	Jackson.
68	Rowe, Wm.	Grand Rapids	Kent.
69	Rose, L. M.	Ludington	Mason.
70	Reynolds, Mrs. L. C.	Jackson	Jackson.
71	Shearer, G. W. M.	Jackson	Jackson.
72	Stevens, Mrs. H.	Jackson	Jackson.
73	Sherman, Mrs. G. H.	Jackson	Jackson,
74	Sherman, Luella	Jackson	Jackson.
75	Spence, E. A.	Ann Arbor	Washtenaw.
76	Souter, A. E.	Shelby	Oceana.
77	Sigler, A.	Adrian	Lenawee.
78	Stayt, ——	Ludington	Mason.
79	Shebans, J.	Ludington	Mason.
80	Shirts, E. J.	Shelby	Oceana.
81	Stearns, J. N.	Kalamazoo	Kalamazoo.
82	Smith, Mrs. L. A.	Jackson	Jackson.
83	True, Mrs. Martin	Rives Junction	Jackson.
84	Thomas, H. F.	Jackson	Jackson.
85	Vick, James	Rochester	*New York.*
86	Van Brunt, R. W.	St. Joseph	Berrien.
87	Woodley, August	New Buffalo	Berrien.
88	Westren, Mrs. Chas. B.	Jackson	Jackson.
89	Woodward, J. S.	Lockport	*New York.*
90	Warner, W.	Ludington	Mason.
91	Webster, Mrs. R. M.	Armada	Macomb.
92	Withington, W. H.	Jackson	Jackson.

The above table shows that in our department of the fair we had ninety-two exhibitors, representing sixteen counties, New York, and Canada.

LIST OF AWARDS MADE BY THE MICHIGAN STATE HORTICULTURAL SOCIETY AT THE FAIR OF 1882.

DIVISION A—GENERAL COLLECTION OF FAMILY FRUITS.

Class 1. Most judiciously selected, best grown, and carefully handled general collection of fruits, affording an adequate set of varieties of each class, as far as practicable, for both dessert and culinary purposes throughout the entire year; collected and exhibited by the accredited representative of a society, grange, or municipality. First premium, Grand River Valley Horticultural society, represented by DeCou and Graham. Second premium, Oceana County Pomological Society, represented by Markham and Souter. Third premium, Mason County Horticultural Society, represented by G. C. McClatchie. Fourth premium, Lawrence Grange No. 32, represented by J. M. Blowers.

The committee in viewing the various collections entered for premiums in this class had a long and arduous labor. Great care was taken in preparing the data upon which the award was to be based, and the various members of the committee cast their votes separately and were unanimous in the above decision. From the notes of the committee the following is taken: In the exhibit of the Grand River Valley Society there were 30 varieties of winter apples, 29 varieties of autumn apples, 8 varieties of pears, 9 of grapes, 14 of peaches, and 3 of plums. In the Oceana collection there were 24 varieties of winter apples, 20 of autumn apples, 6 of pears, 8 of peaches, 25 of plums, and 4 of grapes. In the Mason collection there were 11 varieties of winter apples, 11 of autumn apples, 2 of crab apples, 11 of pears, 7 of peaches, 9 of plums, and 1 of grapes. The Lawrence Grange collection contained 23 varieties of winter apples, 9 of autumn apples, 7 of pears, 9 of peaches, 5 of crab apples, and 1 of plums.

The committee remarks that in comparing collections the rules were strictly adhered to, and many varieties unnamed or incorrectly labeled were thrown out, and no account was taken of duplicate plates.

Class 2. Most judiciously selected, best grown, and carefully handled general exhibit, as above, grown by exhibitor. First premium, A. G. Gulley, South Haven, the collection containing 14 varieties of apples, 9 of pears, 4 of plums, and 6 of grapes. Second premium, D. L. Garver, Hart, Oceana county, the exhibit containing 28 varieties of apples, 2 of pears, 5 of plums, 3 of grapes, and 4 of peaches.

In this division there was a $10 premium on best named collection given to **A. G. Gulley.**

DIVISION B—GENERAL COLLECTION OF MARKET FRUITS.

Class 1. Most judiciously selected, best grown, and carefully handled general collection of market fruits, affording as far as practicable an adequate set of varieties of each throughout the entire year; collected and exhibited by the accredited representative of a society, grange, or municipality. First premium, Berrien County Horticultural Society, represented by Wm. A. Brown, of Stevensville. The collection was made up of 18 varieties of apples, 10 varieties of pears, 4 of plums, 5 of peaches, and 4 of grapes.

The committee found the following very interesting statement accompanying Mr. Brown's collection: "In exhibiting a collection of Berrien county fruits for market purposes I beg leave to call the attention of the committee to the fact that blight in Michigan apples, caused by the cold, wet, frosty spring, is more manifest in Berrien than most other counties in this State. We do not estimate our crop of good, marketable apples at more than one-tenth of an average crop, and we are not able to exhibit several varieties which are distinctively market sorts. In pears we have a fair crop and good showing. The yellows has destroyed our once famous peach orchards, but we are planting again in some localities, and hope by exterminating diseased trees to grow peaches again. We show a few of the old standard varieties, also a few plums. Our county makes a specialty of small fruits, growing for the Chicago market, and the business is immense. The crop of strawberries did not exceed one-third of an average this season ; raspberries were a full crop, and blackberries the largest crop grown in many years, several thousand cases per day having been shipped during many weeks. We show a specimen of Wilson on second growth cane. In grapes the season is two weeks late, and we do not think it desirable to show green, sour grapes, and have confined our exhibit to a few early varieties which are nearly ripe. The Delaware and Concord are, however, our leading market grapes. Our exhibit is intended to show more especially the requirements of the Chicago and western markets. Very respectfully, W. A. Brown, for Berrien County Horticultural Society."

Second premium, Oceana County Pomological Society, represented by Markham and Souter, the exhibit containing 22 plates of apples, 5 of pears, 8 of plums, 3 of peaches. Third premium, Hamilton township, represented by A. A. Olds, of Decatur, the exhibit containing 13 plates of apples, 8 of pears, 6 of peaches, 2 of crabs, 1 grape and 1 plum.

Class 2. Most judiciously selected, best grown and carefully handled general exhibit of market fruits, grown by the exhibitor; conditions otherwise as in class 1. First premium, E. J. Shirts, Shelby, Oceana county. Second premium, J. M. Blowers, Lawrence, Van Buren county.

DIVISION C—SPECIAL EXHIBITS OF APPLES, FOR DESSERT AND CULINARY PURPOSES.

Class 1. Most judiciously selected, best grown and carefully handled exhibit of apples, grown by the exhibitor, affording a choice, as well as a succession of varieties throughout the year for both dessert and culinary purposes; superior quality, delicacy of texture, and beauty, in the order named, to be the ruling considerations. The only premium awarded in this class was to A. A. Olds, of Decatur, who carried away the first.

In nomenclature Mr. D. L. Garver took the first premium of three dollars in this division.

DIVISION D—SPECIAL EXHIBITS OF MARKET APPLES.

Class 1. Most judiciously selected, best grown, and carefully handled exhibit of fifteen varieties of market apples, grown by the exhibitor, affording a succession throughout the year; productiveness, suitable size, handling qualities, satisfactory flavor, and general attractiveness to be the leading considerations. First premium, A. A. Olds, Decatur, on the following list: Blenheim Pippin, Red Canada, Rhode Island Greening, Northern Spy, Golden Russet, Baldwin, Jonathan, Fameuse, Westfield, Seek-no-further, Maiden's Blush, Hubbardston Nonsuch, Talman Sweet, Fallawater, and Esopus Spitzenburgh.

Class 2. Most judiciously selected, best grown, and carefully handled exhibit of five varieties of market apples, grown by the exhibitor, without regard to succession; conditions otherwise as in Class 1. First premium, A. A. Olds, of Decatur, on the following list of varieties: Northern Spy, Maiden's Blush, Red Canada, Melon, Rhode Island Greening. Second premium, J. M. Blowers, Lawrence, who showed the following sorts: Baldwin, Northern Spy, Maiden's Blush, Rhode Island Greening, Red Canada.

In best single variety of market apples, H. F. Thomas, of Jackson, took first premium; J. M. Blowers, of Lawrence, the second, and A. A. Olds, of Decatur, the third.

The committee having the work of making awards in the four preceding divisions called especial attention to the want of taste in the arrangement of collections. The same fruits by properly locating them upon the shelves may enhance the appearance of each other and thus contribute to the general effect of a collection. Very little if any thought seemed to have been given to this matter by any of the exhibitors. Rule 17 of the premium list reads as follows: "The society desires to foster a free exercise by exhibitors of the principles of correct taste in the arrangement, display and ornamentation of their exhibits. To this end committees will give all reasonable and proper consideration to particulars of this character." The committee had this rule before them in discharging their duties, but found little use for it because the exhibitors had all evidently overlooked it. In some cases a want of carefulness in handling by the exhibitors submitted otherwise valuable exhibits to a lower premium, and the committee adhered rigidly to the ruling that worthless varieties add nothing to the value of a collection.

A noticeable feature of all the collections in these divisions was the absence of large, coarse varieties, and the committee could see herein the educating influence of the society in its previous exhibitions.

DIVISION E—SPECIAL EXHIBITS OF PEACHES.

Class 1. Most judiciously selected, best grown, and carefully handled exhibit of peaches, not less than twelve varieties, grown by the exhibitor, adapted to dessert and culinary purposes, and affording a succession throughout the usual season of this fruit. In this class there were five entries, as follows: E. Graham, Grand Rapids; A. G. Gulley, South Haven; J. N. Stearns, Kalamazoo; J. J. Parshall, Ann Arbor; E. J. Shirts, Shelby. The first premium went to A. G. Gulley on the following list: Early Beatrice, Early Louise, Hale's Early, Early Crawford, Barnard, George the Fourth, Snow, Jacques Rareripe, Oldmixon, Hill's Chili, Late Crawford, Smock Free. Second premium, J. N. Stearns, who showed the following varieties: Early Crawford, Snow's Orange, Richmond, Foster, Yellow Alberge, Grand Admirable Cling, Kalamazoo, Mountain Rose, Jacques Rareripe, Oldmixon, Late Crawford, Hill's Chili. E. Graham took third premium on Early Crawford, Barnard, Allen, Oldmixon, Mountain Rose, Richmond, Smock, Snow's Orange, Crawford's Late, Salway, Reynold's Seedling, Stump the World.

Class 2. Most judiciously selected, best grown, and carefully handled exhibit of eight varieties of peaches for market purposes, grown by the exhibitor, and affording a succession as far as practicable. First premium, A. G. Gulley, South Haven, on this list: Early Crawford, Barnard, George the Fourth, Jacques Rareripe, Hill's Chili, Late Crawford, Smock Free, Oldmixon. Second premium, J. N. Stearns, Kalamazoo, on Early Crawford, Richmond, Kalamazoo, Grand Admirable Cling, Mountain Rose, Susquehanna, Oldmixon, Late Crawford.

Class 3. Most profitable, best grown, and carefully handled exhibit of four varieties of peaches for market, without regard to succession, grown by the exhibitor. First premium, A. G. Gulley, on Barnard, Early Crawford, Jacques Rareripe, Hill's Chili. Second premium, J. N. Stearns, on Mountain Rose, Susquehanna, Oldmixon, Jacques Rareripe. Third premium, J. M. Blowers, on Mountain Rose, Early Crawford, Jacques Rareripe, and Oldmixon.

In Class 4, most profitable single market variety of peach, there were four entries of the following varieties: Susquehanna, Late Crawford, Mountain Rose, and Snow's Orange. First premium, Late Crawford, shown by August Woodley, of New Buffalo. Second premium, Mountain Rose, shown by J. N. Stearns. Third premium to Snow's Orange, shown by E. J. Shirts, of Shelby.

DIVISION F—SPECIAL EXHIBITS OF PEARS.

Class 1. Most judiciously selected, best grown, and carefully handled exhibit of pears for dessert or family and culinary purposes, not less than twelve varieties, grown by the exhibitor, affording a succession during the usual season. First premium, A. G. Gulley, South Haven, on the following list: Bartlett, Howell, Buffum, Seckel, Flemish Beauty, Sheldon, Duchess, White Doyenné, Beurre D' Anjou, Lawrence, Louise Bonne de Jersey, Vicar.

Class 2. Most judiously selected, best grown, and carefully handled exhibit of eight varieties of pears for market, with succession, grown by the exhibitor. First premium, A. G. Gulley, on Bartlett, Buffum, Lawrence, Seckel, Duchess, Sheldon, Louise Bonne de Jersey, Howell.

Class 3. Most profitable, best grown, and carefully handled exhibit of four varieties of pears for market, without regard to succession, grown by the exhibitor. Four entries in this class by A. G. Gulley, J. N. Stearns, Robert Van Brunt, and Belle Doney. First premium, J. N. Stearns, on Bartlett, Duchess, Lawrence, Beurre D' Anjou. Second premium, Belle Doney, of Jackson, on Bartlett, Sheldon, Seckel, and Beurre D' Anjou. Third premium, Robert Van Brunt, of St. Joseph, on Bartlett, Beurre Clairgeau, Louise Bonne de Jersey, and Beurre D' Anjou.

In Class 4, best market variety, there were four entries, all Bartletts. First premium, Belle Doney, Jackson. Second premium, J. N. Stearns, Kalamazoo. Third premium, Robert Van Brunt, St. Joseph.

DIVISION G—SPECIAL EXHIBITS OF PLUMS (TWELVE SPECIMENS OF EACH).

Class 1. Most judiciously selected, best grown, and carefully handled exhibit of not less than fifteen varieties of plums for dessert or family and culinary purposes, affording a succession throughout the usual season. First premium, Geo. C. McClatchie, of Ludington, on Damson, German Prune, Green Gage, Coe's Golden Drop, Lawrence's Favorite, Washington, General Hand, Yellow Egg, Guthrie's Late Green, Quackenbos, Prince Engelbert, Red Magnum Bonum, Purple Magnum Bonum, Lombard, and Orleans. Second premium, E. J. Shirts, Shelby, on German Prune, Traverse Seedling, Green Gage, General Hand, Purple Egg, Red Egg, Yellow Egg, Lombard, Lawrence's Favorite, Canada Egg, Peach, Prince's Yellow Gage, Lombard Seedling, Columbia, and Bradshaw.

Class 2. Most judiciously selected, best grown, and carefully handled exhibit of ten varieties of plums for dessert, family, and culinary purposes, grown by the exhibitor, affording a succession during the usual season of this fruit. First premium to E. J. Shirts, of Shelby, on the first ten varieties named in his list under Class 1.

Class 3. Exhibit of most profitable, best grown, and carefully handled five varieties of plums for market purposes regardless of succession, grown by the exhibitor. There were four entries made in this class by J. Shebans, W. Warner, of Ludington, E. J. Shirts, Shelby, and D. L. Garver, Hart. First Premium, J. Shebans, on Lombard, Smith's Orleans, Washington, Red Magnum Bonum, Yellow Egg. Second premium, D. L. Garver, on Imperial Gage, Lombard, Red Magnum Bonum, Yellow Egg, and Purple Seedling. Third premium, E. J. Shirts.

In Class 4, best single market variety, E. J. Shirts took first premium on Red Magnum Bonum, G. C. McClatchie second, on Purple Magnum Bonum, C. Gibbs third on Purple Magnum Bonum.

In the above division G. C. McClatchie took a first premium of two dollars for correct nomenclature and E. J. Shirts a second one of one dollar for same.

DIVISION H—SPECIAL EXHIBITS OF GRAPES.

Class 1. Most judiciously selected, best grown, and carefully handled exhibit of not less than fifteen varieties of native grapes, grown in the open air by the exhibitor, adapted to dessert and family purposes, and affording a succession throughout the usual season of this fruit. There was but one entry in this class by J. W. Helme, of Adrian. It was awarded a first premium and contained the following sorts: Talman, Janesville, Cottage, Wyoming Red, Hartford, Massasoit, Delaware, Concord, Agawam, Rogers' 36, Martha, Lindley, Isabella, Catawba, and Elvira, all grown on three-years vines, and on account of the peculiar season all immature except the first five.

Class 2. Most judiciously selected, best grown, and carefully handled exhibit of ten varieties of native grapes for dessert and family purposes, grown in the open air, by the exhibitor, affording a succession throughout the usual season of this fruit. In this class also Mr. Helme's was the only entry, but the committee considered it worthy a first premium. The selection of varieties was as follows: Talman, Jonesville, Barry, Hartford, Delaware, Concord, Lindley, Martha, Isabella, Catawba.

Class 3. Most profitable, best grown, and carefully handled exhibit of five varieties of native grapes, for market purposes, grown in the open air, by the exhibitor, without regard to succession. First premium, Robert W. Van Brunt, St. Joseph, on the following list: Concord, Hartford, Delaware, Agawam, Salem. Second premium, J. W. Helme, on Talman, Hartford, Concord, Delaware, and Isabella.

In Class 4, best single variety for market, only Concords were entered, upon which Robert Van Brunt took the first and J. W. Helme the second premium.

The remaining two classes in this division include only foreign grapes grown under glass. Mr. A. Sigler entered in both classes and made a very creditable exhibit. The committee awarded him a first premium on both entries and said his clusters were all well ripened and in excellent condition.

In this division Robert Van Brunt carried off the premium on nomenclature.

DIVISION J—APPLES, SINGLE PLATES.

In this division there were just an even one hundred entries, but the exhibit as a whole was inferior to former years. The following abstract shows the distribution of premiums:

Large Early Bough—First Premium, Elwood Graham, Grand Rapids.

Duchesse of Oldenburg—First premium, H. Beebe, Ludington.

Hawley—First premium, E. Graham, Grand Rapids.

Keswick Codlin—First premium G. C. McClatchie, Ludington.

Lowell—First premium, Robert W. Van Brunt, St. Joseph; second premium, G. W. M. Shearer, Jackson; third premium, E. Graham, Grand Rapids.

Maiden's Blush—First premium, Mrs. D. H. Ranney, Jackson; second premium, Mrs. J. C. Lowell, Jackson; third premium, E. Graham, Grand Rapids.

Melon—First premium, J. M. Blowers, Lawrence; second premium, A. A. Olds, Decatur.

Twenty Ounce—First premium, M. Purdy, Ludington; second premium, Mrs. Durham, Ludington; third premium, A. A. Olds, Decatur.

Baldwin—First premium, J. N. Peck, Jackson; second premium, W. H. Overholt, Mason; third premium, A. A. Olds, Decatur.

Fameuse—Second premium, A. A. Olds, Decatur.

Golden Russet—First premium, W. H. Overholt, Mason; second premium, G. W. M. Shearer, Jackson; third premium, A. A. Olds, Decatur.

Grimes' Golden—First premium, E. Graham, Grand Rapids; third premium, H. F. Thomas, Jackson.

Hubbardston Nonsuch—First premium, A. A. Olds, Decatur.

King of Thompkins County—First premium, E. Graham, Grand Rapids; second premium, G. W. M. Shearer, Jackson; third premium, A. A. Olds, Decatur.

Northern Spy—First premium, A. A. Olds, Decatur; third premium, E. Graham, Grand Rapids.

Red Canada—First premium, G. W. M. Shearer, Jackson; third premium, J. M. Blowers, Lawrence.

Rhode Island Greening—First premium, G. W. M. Shearer, Jackson; second premium, J. N. Peck, Jackson; third premium, A. A. Olds, Decatur.

Roxbury Russet—First premium, J. N. Peck, Jackson: second premium, W. H. Overholt. Mason; third premium, E. Graham, Grand Rapids.

Swaar—A very fine plate of Mann apples were entered in this class by Mr. W. H. Overholt, the incorrect nomenclature forbidding a premium.

Peck's Sweeting—Second premium, E. Graham, Grand Rapids.

Wine—Second premium, E. Graham, Grand Rapids.

Rambo—Third premium, E. Graham, Grand Rapids.

Black Gilliflower—First premium, E. Graham, Grand Rapids.

Washington Strawberry—First premium, E. Graham, Grand Rapids.

Byers Beauty—First premium, A. A. Olds, Decatur.

Hyslop—Second premium, E. J. Shirts, Shelby.

Transcendent—Third premium, E. J. Shirts, Shelby.

DIVISION K—PEARS—SINGLE PLATES.

There were about ninety entries in this division of very fine fruit. The following are the premiums awarded:

Bartlett—First premium, Philo Parsons, Detroit; second premium, J. N. Peck, Jackson; third premium, Belle Doney, Jackson.

Beurre Bosc—First premium, Emil Baur, Ann Arbor.

Beurre Deil—First premium, Philo Parsons, Detroit; second premium, B. Harrington, Jackson.

Beurre D'Anjou—First premium, J. N. Stearns, Kalamazoo; second premium, R. W. Van Brunt, St. Joseph; third premium, Belle Doney, Jackson.

Buffum—First premium, A. G. Gulley, South Haven; third premium, J. W. Helme, Adrian.

Clapp's Favorite—First premium, H. F. Thomas, Jackson; second premium, W. H. Overholt, Mason.

Duchesse—First premium, Philo Parsons, Detroit; second premium, R. W. Van Brunt, St. Joseph; third premium, J. J. Parshall, Ann Arbor.

Flemish Beauty—First premium, L. M. Rose, Ludington; also a first premium to J. J. Parshall, Ann Arbor; third premium, Emil Baur, Ann Arbor.

Fondante D'Automne—First premium, Philo Parsons, Detroit.

Howell—First premium, A. G. Gulley, South Haven; second premium, E. J. Shirts, Shelby.

Lawrence—First premium, J. N. Stearns, Kalamazoo; second premium, A. G. Gulley, South Haven; third premium, J. W. Helme, Adrian.

Louise Bonne de Jersey—First premium, J. N. Peck, Jackson; second premium, Robert Van Brunt, St. Joseph; third premium, Emil Baur, Ann Arbor.

Onondaga—First premium, W. Owen, Adrian.

Seckel—First premium, Philo Parsons, Detroit; second premium, Belle Doney, Jackson; third premium, J. N. Stearns, Kalamazoo.

Sheldon—First premium, Cornwall & Potter, Jackson; second premium, L. C. Adams, Horton; Third premium, J. N. Stearns, Kalamazoo.

Tyson—Second premium, B. Harrington, Jackson.

Vicar—First premium, H. F. Thomas, Jackson.

White Doyenné—First premium, Philo Parsons, Detroit.

Beurre Superfine—Second premium, Emil Bauer, Ann Arbor.

Beurre Langelier—First Premium, T. T. Lyon, South Haven.

DIVISION L—PEACHES—SINGLE PLATES.

There were 75 entries in this division and the awards distributed as follows:

Barnard—First premium, E. J. Shirts, Shelby; second premium, A. G. Gulley, South Haven; third premium, Emil Bauer, Ann Arbor.

Early Crawford—First premium, S. W. Dorr, Manchester; second premium, A. G. Gulley, South Haven; third premium, Mrs. J. C. Lowell, Jackson.

Late Crawford—First premium, J. N. Peck, Jackson; third premium, J. W. Helme, Adrian.

Foster—First premium, S. W. Dorr, Manchester; second premium, J. N. Stearns, Kalamazoo; third premium, E. J. Shirts, Shelby.

Upon the first named plate of Fosters the committee remark, "As fine a plate as ever seen."

George the Fourth—First premium, A. G. Gulley, South Haven.

Hale's Early—First Premium—Dr. A. Conklin, Manchester.

Hill's Chili—First premium, A. G. Galley, South Haven; second premium, E. J. Shirts, Shelby.

Jacques Rareripe—First premium, A. G. Gulley, South Haven; second premium, J. N. Stearns, Kalamazoo.

Large Early York—First premium, Dr. A. Conklin, Manchester.

Mountain Rose—First premium, J. N. Stearns, Kalamazoo; second premium, J. M. Blowers, Lawrence.

Oldmixon—First premium, J. N. Stearns, Kalamazoo; second premium, J. W. Helme, Adrian; third premium, A. G. Gulley, South Haven.

Richmond—First premium, J. N. Stearns, Kalamazoo.

Smock—First premium, A. G. Gulley, South Haven.

Snow's Orange—First premium, E. J. Shirts, Shelby.

Stump the World—First premium, E. J. Shirts, Shelby.

Susquehanna—First premium, E. A. Spence, Ann Arbor; second premium, J. N. Stearns, Kalamazoo; third premium, E. A. Spence, Ann Arbor.

Early Curtis—First premium, Dr. A. Conkling, Manchester.

This peach was named by the Washtenaw County Pomological Society, and is two weeks earlier than Hale's Early.

Kalamazoo—First premium, J. N. Stearns, Kalamazoo.

DIVISION M—GRAPES—SINGLE PLATES.

There were but 50 entries in this division.

Agawam—First premium, Robert Van Brunt, St. Joseph; second premium, J. W. Helme, Adrian.

Allen's Hybrid—First premium, A. Sigler, Adrian.

Aminia—First premium, J. W. Helme, Adrian.

Concord—First premium, Robert W. Van Brunt, St. Joseph; second premium, E. Graham, Grand Rapids; third premium, Mrs. Martin True, Rives Junction.

Delaware—First premium, E. Graham, Grand Rapids; third premium, J. N. Peck, Jackson.

Hartford—Second premium, R. W. Van Brunt, St. Joseph; third premium, J. N. Stearns, Kalamazoo.

Iona—First premium, R. W. Van Brunt, St. Joseph; second premium, W. Owen, Adrian.

Isabella—Third premium, J. W. Helme, Adrian.

Martha—First premium, J. N. Peck, Jackson; second premium, R. W. Van Brunt, St. Joseph.

Salem—First premium, R. W. Van Brunt, St. Joseph; third premium, E. Graham, Grand Rapids.

Talman—First premium, E. Graham, Grand Rapids.

Worden—First premium, Munson & Knapp, Grand Rapids; second premium, R. W. Van Brunt, St. Joseph.

Rogers' 36—First premium, J. W. Helme, Adrian.

There was a fine display of Niagara grapes made by the Niagara Grape Company. These were not entered for competition, but exhibition only. The committee announced themselves very much pleased with the exhibition, and said the variety was very fine in bunch, berry, and quality.

DIVISION N—PLUMS, QUINCES, AND CRANBERRIES—SINGLE PLATES.

There were 56 entries in this division.

Coe's Golden Drop—First premium, E. J. Shirts, Shelby.

Columbia—First premium, E. J. Shirts, Shelby.

General Hand—First premium, E. J. Shirts, Shelby.

German Prune—First premium, A. G. Gulley, South Haven; second premium, E. J. Shirts, Shelby; third premium, Emil Baur, Ann Arbor.

Imperial Gage—Fisst premium, D. L. Garver, Hart; second premium, E. J. Shirts, Shelby.

Lawrence's Favorite—First premium, E. J. Shirts, Shelby.

Lombard—First premium, E. J. Shirts, Shelby; second premium, D. L. Garver, Hart; third premium, A. G. Gulley, South Haven.

McLaughlin—First premium, E. J. Shirts, Shelby.

Pond's Seedling—First premium, E. J. Shirts, Shelby.

Yellow Egg—First premium, E. J. Shirts, Shelby; second premium, D. L. Garver, Hart.

Orange Quince—First premium, Wm. J. Knott, Benton Harbor.

Cherry Shaped Cranberry—First premium, E. J. Shirts, Shelby.

High Bush Cranberry—First premium, E. J. Shirts, Shelby.

DIVISION O—DRIED FRUITS.

There were above 150 entries in this division.

Collection of Dried Fruits by a Factory—First premium (diploma of the Society), J. A. & H. Bartholomew, Vanessa, Ontario, Canada.

Collection Domestic Dried Fruits—First premium, Mrs. W. H. Overholt, Mason; second premium, Mrs. R. M. Webster, Armada.

Dried Apples—First premium, Nellie S. Nabors, Flint; second premium, Mrs. D. H. Ranney, Jackson.

Dried Pears—First premium, Nellie S. Nabors, Flint; second premium, Mrs. R. M. Cook, Charlotte.

Dried Peaches—First premium, Mrs. D. H. Ranney, Jackson; second premium, Mrs. W. H. Overholt, Mason.

Dried Plums—First premium, Mrs. W. H. Overholt, Mason; second premium, L. C. Lincoln, Greenville.

Dried Cherries—First premium, Mrs. D. K. Emmons, Byron Center; second premium, Mrs. R. M. Webster, Armada.

Dried Strawberries—First premium, Mrs. W. H. Overholt, Mason; second premium, Nellie S. Nabors, Flint.

Dried Raspberries—First premium, L. C. Lincoln, Greenville; second premium, Mrs. R. M. Webster, Armada.

Dried Blackberries—First premium, Mrs. D. K. Emmons, Byron Center; second premium, Mrs. Wm. H. Overholt, Mason.

Dried Huckleberries—First premium, Mrs. Nellie S. Nabors, Flint; second premium, Mrs. Wm. H. Overholt, Mason.

Dried Quinces—Second premium, Mrs. R. M. Cook, Charlotte.

Dried Currants—First premium, Mrs. Wm. H. Overholt, Mason; second premium, Mrs. D. K. Emmons, Byron Center,

Dried Gooseberries—First premium, Mrs. Nellie S. Nabors, Flint; second premium, Mrs. R. M. Cook, Charlotte.

Dried Elderberries—First premium, Mrs. R. M. Webster, Armada; second premium, Mrs. M. E. Bartlett, Tompkins Center.

Dried Grapes—First premium, Mrs. Wm. H. Overholt, Mason; second premium, Gertie McClary, Galesburg.

There were a number of samples of dried fruits and vegetables shown by all the exhibitors named above in this division not enumerated in the list. They were all very fine and as worthy of premiums as many samples which received awards; but the committee did not feel warranted in awarding premiums because each variety was certainly as worthy as another, and once beginning on this list there would be no stopping. If the executive board see fit to enlarge this division so as to include other fruits and vegetables, there will be plenty of entries. We suggest that it is worthy of consideration.

DIVISION P—CANNED AND PICKLED FRUITS.

There was a very large and beautiful exhibit in the classes of this division, there being 200 entries.

Collection of domestic canned and pickled fruits—First premium, Mrs. Wm. H. Overholt, Mason; second premium, L. C. Lincoln, Greenville.

Canned Apples—First premium, L. C. Lincoln, Greenville; second premium, L. E. Nabors, Flint.

Canned Pears—First premium, Mrs. Chas. B. Westren, Jackson; second premium, Mrs. G. F. Merritt, Jackson.

Canned Peaches—First premium, Mrs. W. H. Overholt, Mason; second premium, Mrs. Chas. B. Westren, Jackson.

Canned Plums—First premium, Mrs. Wm. H. Overholt, Mason; second premium, L. E. Nabors, Flint.

Canned Cherries—First premium, J. W. Helme, Adrian; second premium, Mrs. Wm. H. Overholt, Mason.

Canned Crab Apples—First premium, Mrs. R. M. Cook, Charlotte; second premium, L. E. Nabors, Flint.

Canned Strawberries—First premium, Mrs. Wm. H. Overholt, Mason; second premium, L. C. Lincoln, Greenville.

Canned Raspberries—First premium, L. E. Nabors, Flint; second premium, L. C. Lincoln, Greenville.

Canned Blackberries—First premium, R. W. Van Brunt, St. Joseph; second premium, Mrs. Wm. H. Overholt, Mason.

Canned Huckleberries—First premium, L. C. Lincoln, Greenville; second premium, L. E. Nabors, Flint.

Canned Quinces—First premium, J. W. Helme, Adrian; second premium, Mrs. W. H. Overholt, Mason.

Canned Gooseberries—First premium, J. W. Helme, Adrian; second premium, L. E. Nabors, Flint.

Canned Currants—First premium, J. W. Helme, Adrian; second premium, Mrs. R. M. Webster, Armada.

Canned Grapes—First premium, Mrs. R. E. Clark, Jackson; second premium, L. E. Nabors, Flint.

Pickled Pears—First premium, Mrs. R. M. Cook, Charlotte; second premium, Mrs. W. H. Overholt, Mason.

Pickled Peaches—First premium, J. W. Helme, Adrian; second premium, Mrs. R. E. Clark, Jackson.

Pickled Apples—First premium, J. W. Helme, Adrian; second premium, Mrs. R. M. Webster, Armada.

Pickled Cherries—First premium, Mrs. R. M. Cook, Charlotte; second premium, L. C. Lincoln, Greenville.

The same remark regarding non-enumerated articles which was made at close of division O applies to this denomination also.

DIVISION Q—PRESERVED FRUITS AND JELLIES.

There were nearly 200 entries in this division.

Collection Preserved Fruits and Jellies—First premium, L. C. Lincoln, Greenville; second premium, Mrs. R. M. Webster, Armada.

Cider Apple Sauce—First premium, Mrs. R. M. Cook, Charlotte; second premium, J. W. Helme, Adrian.

Preserved Pears—First premium, J. W. Helme, Adrian; second premium, Mrs. R. M. Cook, Charlotte.

Preserved Peaches—First premium, Mrs. R. M. Cook, Charlotte; second premium, Mrs. M. E. Bartlett, Tompkins Center.

Preserved Plums—First premium, Mrs. W. H. Overholt, Mason; second premium, J. W. Helme, Adrian.

Preserved Cherries—First premium, Mrs. R. M. Webster, Armada; second premium, Mrs. W. H. Overholt, Mason.

Preserved Strawberries—First premium, J. W. Helme, Adrian; second premium, Mrs. W. H. Overholt, Mason.

Preserved Raspberries—Frst premium, Mrs. M. E. Bartlett, Tompkins Center; second premium, L. C. Lincoln, Greenville.

Preserved Blackberries—First premium, L. C. Lincoln, Greenville; second premium, J. W. Helme, Adrian.

Preserved Huckleberries—First premium, Mrs. J. F. Drew, Jackson; second premium, R. M. Webster, Armada.

Preserved Quinces—Second premium, Mrs. R. M. Webster, Armada.

Preserved Currants—First premium, Mrs. J. F. Drew, Jackson; second premium, Mrs. M. E. Bartlett, Tompkins Center.

Collection of Jellies—First premium, Nellie S. Nabors, Flint; second premium, Mrs. Wm. H. Overholt, Mason.

Currant Jelly—First premium, Mrs. R. M. Webster, Armada; second premium, J. N. Stearns, Kalamazoo.

Apple Jelly—First premium, J. W. Helme, Adrian; second premium, Nellie S. Nabors, Flint.

Siberian Crab Jelly—First premium, Mrs. R. M. Webster, Armada; second premium. J. W. Helme, Adrian.

Grape Jelly—First premium, J. N. Stearns, Kalamazoo; second premium, Mrs. D. K. Emmons, Byron Center.

Raspberry Jelly—First premium, L. C. Lincoln, Greenville; second premium, J. N. Stearns, Kalamazoo.

Blackberry Jelly—First premium, Nellie S. Nabors, Flint; second premium, Mrs. R. M. Cook, Charlotte.

Quince Jelly—First premium, Mrs. W. H. Overholt, Mason; second premium, Nellie S. Nabors, Flint.

Strawberry Jelly—Second premium, Mrs. M. E. Bartlett, Tompkins Center.

Apple Butter—First premium, J. W. Helme, Adrian; second premium, Nellie E. Nabors, Flint.

Gooseberry Jelly—First premium, J. W. Helme, Adrian; second premium, Nellie S. Nabors, Flint.

DIVISION R—NURSERY STOCK.

Class 2. Best grown and best conditioned exhibit of nursery apple trees of the most desirable varieties, correctly labeled; the product of a Michigan nursery—First premium, a life membership in State Horticultural Society, L. G. Bragg & Co., Kalamazoo.

Class 3. Finest, most extensive, and best conditioned exhibit of nursery peach trees, one year's growth from the bud, the most desirable assortment of varieties, and correctly labeled; the product of a Michigan nursery—First premium, a life membership in State Horticultural Society, J. N. Stearns, Kalamazoo.

DIVISION T—PLANTS IN POTS—PROFESSIONAL LIST.

Six Ferns—First premium, W. R. Hibbard, Jackson; second premium, Alex. Brown, Jackson.

Collection Green House and Stove Plants—First premium, W. R. Hibbard, Jackson; second premium, Alex. Brown, Jackson.

Collection of Green House Plants in Flower—First premium, W. R. Hibbard, Jackson.

Collection of Green House Foliage Plants—First premium, Alex. Brown, Jackson; second premium, W. R. Hibbard, Jackson.

Six Begonias—First premium, Mrs. Dr. Andrews, Jackson; second premium, Alex. Brown, Jackson.

Six Cacti—First premium, W. R. Hibbard, Jackson; second premium, Wm. Bankson, Jackson.

Six Dracœnas—First premium, W. R. Hibbard.

Ten Fuchsias—First premium, W. R. Hibbard.

Six Ornamental Leaved Geraniums—First premium, Alex. Brown; second premium, W. R. Hibbard.

Ten Single Flowering Geraniums—First premium, W. R. Hibbard; second premium, Alex. Brown.

Six Double Flowering Geraniums—First premium, Alex. Brown; second premium, W. R. Hibbard.

Six Coleus—First premium, W. R. Hibbard; second premium, Alex. Brown.

Specimen Dracœna—First premium, W. R. Hibbard.

Foliage Begonia—First premium, Alex. Brown; second premium, Mrs. Dr. Andrews.

Flowering Begonia—First premium, W. R. Hibbard; second premium, Mrs. Dr. Andrews.

Coleus—First premium, Alex. Brown; second premium, W. R. Hibbard.

Fuchsia—First premium, Mrs. Dr. Andrews; second premium, W. R. Hibbard.

Agave—First premium, W. R. Hibbard.

Double Geranium—First premium, W. R. Hibbard; second premium, Alex. Brown.

Tuberose—First premium, Mrs. Dr. Andrews; second premium, W. R. Hibbard.

Tuberose Pearl—First premium, W. R. Hibbard; second premium, Mrs. Dr. Andrews.

Salvia—First premium, Mrs. Dr. Andrews.

Tree Fern—First premium, W. R. Hibbard.

Specimen Fern—First premium, W. R. Hibbard; second premium, Alex. Brown.

Bourbon or Tea Rose—Second premium, W. R. Hibbard.

Alternanthera—First premium, Alex. Brown.

Standard Orange—First premium, Mrs. Dr. Andrews.
Dwarf Orange—First premium, Mrs. Dr. Andrews.
Centauria Gymnocorpa—First premium, W. R. Hibbard.
Dwarf Pomegranate—First premium, W. R. Hibbard.
Ficus Parcelie—First premium, W. R. Hibbard.
Eucharis Amazonica—First premium, W. R. Hibbard.
Smilax—First premium, W. R. Hibbard.
Banana—First premium, W. R. Hibbard.
Green House Climber—First premium, W. R. Hibbard.

DIVISION U—PLANTS IN POTS—AMATEUR LIST.

20 House Plants in Variety—First premium, Wm. M. Bennett, Jackson; second premium, Mrs. John Murray, Jackson.

Six Ornamental Leaved Geraniums—First premium, Wm. M. Bennett.
Eight Single Flowering Geraniums—First premium, Wm. M. Bennett.
Six Double Flowering Geraniums—First premium, Wm. M. Bennett.
Six Named Coleus—First premium, Wm. M. Bennett.
Ornamental Geranium—First premium, Wm. M. Bennett.

Single Flowering Geranium—First premium, J. H. Purves, Jackson; second premium, Wm. M. Bennett.

Double Flowering Geranium—First premium, Wm. M. Bennett.
Scented Leaved Geranium—First premium, Wm. M. Bennett.
Ivy Leaved Geranium—First premium, Wm. M. Bennett.
Abutilon—First premium, Wm. M. Bennett.
Calla—First premium, Wm. M. Bennett.
Oleander—First premium, Wm. M. Bennett.
Salvia—First premium, J. H. Purves; second premium, Wm. M. Bennett.
Foliage Begonia—First premium, Wm. M. Bennett.

Flowering Begonia—First premium, Wm. M. Bennett; second premium, Nellie C. Jenkins, Jackson.

Coleus—Second premium, Nellie C. Jenkins.
Carnation—First premium, Wm. M. Bennett.
Fuchsia—First premium, Wm. M. Bennett.
Primrose—Second premium, Wm. M. Bennett.
Centanna—First premium, Wm. M. Bennett.
Tuberose—First premium, Wm. M. Bennett.
Heliotrope—First premium, Wm. M. Bennett.
Tuberose Pearl—First premium, Wm. M. Bennett.
Vincas—First premium, Mrs. John Murray.
Pyrethrum—First premium, Mrs. John Murray.
Stand of Plants for Window—First premium, J. H. Purves.

Hanging Basket—First premium, Wm. M. Bennett; second premium, Eli Fish.

Climbing House Plant—First premium, J. H. Purves.
Smilax—First premium, Mrs. John Murray.

Mr. Bennett is entitled to great credit for a fine display of Coleus and other plants not entered for premium.

DIVISION V—BEDDING PLANTS AND CUT FLOWERS.

Collection 10 Bedding Plants—First premium, W. R. Hibbard.

Display of Cut Flowers—First premium, W. R. Hibbard; second premium, Nellie C. Jenkins.

Collection of Grasses—First premium, Mrs. R. M. Cook, Charlotte; second premium, L. C. Lincoln, Greenville.

Collection Sweet Peas—First Premium, Mrs. Mary Merriman, Jackson; second premium, Wm. Rowe, Grand Rapids.

Twelve Verbenas—First premium, W. R. Hibbard; second premium, Mrs. R. M. Cook.

Twelve Dahlias—First premium, Mrs. Dr. Andrews; second premium, Mrs. F. J. Lewis.

Twelve Gladioli—First premium, Mrs. J. P. Owen, Adrian.

Twelve Roses—First premium, W. R. Hibbard.

Twelve Asters—First premium, Nellie C. Jenkins; second premium, Minnie De Puy.

Twelve Pansies—First premium, W. R. Hibbard; second premium, Mrs. J. P. Owen.

Twelve Carnations—First premium, W. R. Hibbard.

Twelve Balsams—First premium, Nellie C. Jenkins.

Phlox Drummondii—First premium, Nellie C. Jenkins; second premium, Wm. Rowe.

Dianthus—First premium, Alex. Brown.

Collection Cannas—First premium, W. R. Hibbard.

Exhibit Cut Flowers, non-enumerated—First premium, Mrs. J. P. Owen.

DIVISION W—BOUQUETS AND FLORAL DESIGNS.

Pair Bouquets of Flowers—First premium, W. R. Hibbard; second premium, Alex. Brown.

Pair Bouquets of Grasses—Second premium, Mrs. R. M. Cook.

Pair Boquets of Everlastings—First premium, Mrs. Wm. Prentiss, Windsor; second premium, Mrs. Wm. H. Overholt, Mason.

Pair Bouquets of Flowers and Grasses—First premium, Mrs. Wm. Prentiss; second premium, Nellie C. Jenkins.

Pair of Vases with Flowers—First premium, W. R. Hibbard.

Design in Flowers and Grasses—First premium, Mrs. Dr. Andrews; second premium, Alex. Brown.

Fancy Basket of Flowers—First premium Alex. Brown; second premium, Mrs. Dr. Andrews.

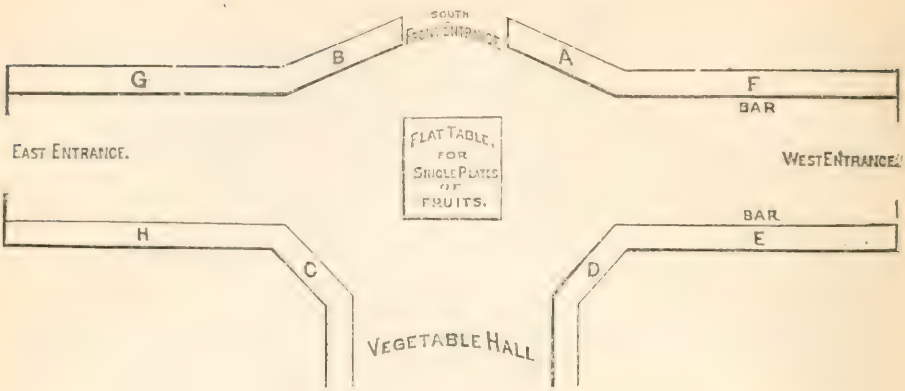
Design for Center Table—First premium, W. R. Hibbard; second premium, Mrs. Dr. Andrews.

Floral Novelty—First premium, Mrs. J. P. Owen, Adrian; second premium, Nellie C. Jenkins.

Arrangement of Autumn Leaves and Flowers—Second premium, Nellie C. Jenkins.

Basket of Everlastings—First premium, Mrs. Wm. Prentiss.

DIVISION X—SPECIAL PREMIUMS.



Ground Plan of Horticultural Hall.

The side walls of Pomological Hall, above the shelving, were divided into eight sections (see above cut); and the following special premiums were offered for their ornamentation. The competing parties, on making their entries, were allowed to select each a section, and were left each to his own judgment and taste as to material employed and style of ornamentation, provided that it should be such as would retain its beauty during the fair. The whole had to be completed prior to the morning of Monday, the first day of the fair, in order not to interfere with the putting up of exhibits of fruits, etc.

	1st Prem.
For the most elaborate, tasteful, and effective specimen of ornamentation upon the side walls of Horticultural Hall, designed as A, B, C, D, facing center	$20 00
For the second, ditto	15 00
For the third, ditto	10 00
For the fourth, ditto	5 00
For the most elaborate, tasteful, and effective specimen of ornamentation of the walls of Horticultural Hall, designed as E, F, G, H, in wing	20 00
For the second, ditto	15 00
For the third, ditto	10 00
For the fourth, ditto	5 00
For the most tasteful and effective design for the ornamentation of the central space above the table of single plates (at Jackson) such design to be submitted at least one week prior to the fair; and, if accepted, to be completed, in position, prior to the putting up of fruits on the first day of the exhibition	20 00
or diploma, at the discretion of the Executive Board.	

Section B was taken by Mrs. B. Kellerman, of New Buffalo, who displayed, without any effective arrangement, a large number of designs in everlastings, grasses, etc. The people who saw this decorative display supposed it to be a simple show wall of what the competitor had to sell. The wall was neatly covered with white cambric, hiding the deformities of the old boards, which formed the sheathing of the hall. Beyond this there was not the least bit of art in the arrangement, and as a competing entry was not considered by the Executive Board.

Section C was taken by Mrs. Dr. Andrews, of Jackson, who covered the wall with a delicate fabric and arranged the display about a large picture, which consisted of a very deft arrangement of lithographs from various catalogues and magazines. On either side of the center picture was a piece in oil, and about these pictures smilax was trained in quite a tasty manner. Plants in pots were arranged at the base of the decorated wall.

Section D was taken by Robert T. McNaughton, of Jackson. The background was brown cloth and the motto "HORTICOLA REGINA EST," in clear type, was thrown across the section from the upper left hand corner to the lower right hand corner. About this were arranged pampas plumes, plants in pots, and evergreen, with some small engravings, baskets of fruit, and other appropriate material. The center piece was the illuminated certificate of life-membership in the Michigan State Horticultural Society.

Section G was taken by L. C. Lincoln, of Greenville, who occupied a good deal of time in making an unique arrangement of agricultural and horticultural products upon a rather small portion of the section. A motto indicating Michigan's position as a fruit State was built out of the fruits of the field and orchard. The arrangement attracted a good deal of attention.

Section H was taken by H. F. Thomas, of Jackson, who put a frieze of evergreen the whole length of the section, with sprays of the same material prettily arranged about the angles and lines of timber. A picture of some kind was placed in each panel.

Section E was taken by Mrs. G. H. Sherman, and Section F by her daughter Luella. These attempts were so far short of the expectations of the committee and so little taste exhibited in the arrangements that they were thrown out of competition.

A third premium of $10 was awarded Mr. McNaughton and Mr. Thomas; a fourth premium given Mrs. Dr. Andrews and Mr. Lincoln.

The awards were made by ballot cast by the members of the Executive Board at the Secretary's desk, and the decision was unanimous. Without further comment upon the entries in this division, the Secretary simply announces that upon a future page of this volume a more complete account of the views of the awarding committee will be given, with suggestions as to how the first premiums might have been taken.

ANNUAL MEETING.

HELD IN THE CITY OF FLINT, MONDAY, TUESDAY, AND WEDNESDAY, DECEMBER 4, 5, and 6, 1882.

FULL PROCEEDINGS, INCLUDING FULL TEXT OF PROMINENT PAPERS, AND ABSTRACTS OF ALL THE ESSAYS AND ADDRESSES.

The announcement of the annual meeting of 1882 was very widely circulated, and delegations were present from a wide extent of territory. Mr. Aldrich, Secretary of the Genesee County Horticultural Society, in commenting upon the meeting in his own paper, the Flint Globe, speaks as follows of the people present:

"The attendance of persons from abroad was large, and included a number of men who stand high upon the roll of the distinguished pomologists of this State, New York, and Canada. Among them we name Hon. T. T. Lyon, President of the Society; Hon. C. W. Garfield, Secretary; Profs. Beal and Cook, of the Agricultural College; Prof. Emil Bauer, J. D. Baldwin, Mr. Crozier, and others, of Ann Arbor; Mr. Hoag, of Lockport, N. Y.; Messrs. Gott and Milborn, of Arkona, Ontario; Hon. John Abbott and H. W. Davis, of Lapeer, the latter the Secretary of the Lapeer County Horticultural Society; J. W. Van Deman, Secretary of the Benzie County Society, besides delegations from Ionia, Eaton Rapids, South Haven, Hudson, Lansing, Adrian, Trenton, Ontario, Manchester, Eaton Rapids, and Grand Rapids. Indeed, about every locality in the State, except Genesee county, was well represented."

The last remark was very true; the local attendance, except the last evening, was very light. But the officers of the Genesee Society were indefatigable in their efforts to make the meeting successful. Mr. Aldrich, Mr. Wesson, Mr. Pierson, Mr. Partridge, Mr. Rosenkrans, and others, were in constant attendance throughout the sessions, rendering aid wherever necessary, and making everybody contented and happy.

The meeting was convened in High School hall, a commodious room upon the third floor of the Central school building. A series of shelves on one side of the hall contained the exhibits, which were large and attractive.

Most of the delegations from abroad, notably Eaton Rapids, Ionia, New York, Ann Arbor, and Benzie, brought fine exhibits of fruits, canned goods, and vegetables. The few exhibits made from Genesee county ranked as high as the best, showing that all she needs to place her in the front rank, is enterprise. Among her exhibitors were Mr. Wesson, Mr. Rosenkrans, Mr. Beecher, Mr. Partridge, Mr. Van Kuren, Mr. E. J. Pierson, Mr. John Morley, Buskirk & Cook Brothers, R. H. Hughes, J. L. Wilcox, and others; Mrs. Damon Stewart made a fine display of oranges; W. Z. Hutchinson, of Rogersville, and Mr. West, and Mr. Koepen, of Flint, showed a fine display of honey, and apiarian apparatus. A number of the proprietors of jelly factories made exhibits. Hon. LeRoy Parker showed some specimens of wine from Concord grapes. Mr. Ed. Monaghan, of Grand Blanc, showed six varieties of potatoes, and John Morley, besides several varieties of apples, made a magnificent show of vegetables. There were about 120 plates of apples, 15 or 20 of pears, and several of grapes. Darwin Smith made a fine display of plants from his new greenhouse on East street, which added vastly to the interest of the meeting.

The meeting was opened on the evening of December 4th, with prayer by the Rev. O. R. L. Crozier, of Ann Arbor, after which Mayor Atwood delivered the following address of welcome:

Members of the Michigan State Horticultural Society:

LADIES AND GENTLEMEN:—I see I am down on the programme to welcome the State Horticultural Society to Flint. I wish it had fallen to the lot of some one better fitted for the occasion.

But, gentlemen, in the name of the citizens of Flint, I extend to you a hearty welcome to this hall, and to our city, and to the generous hospitality of our citizens, and bid you a God speed in your useful work, for the improvement of our fruits, our gardens, and our farms.

I assure you that during your stay with us you will find that our citizens will extend to you that generous hospitality for which they are so justly noted, and hope that your stay with us will be pleasant to you, as I assure you it will be to us. I feel assured that your work and deliberations here will be beneficial to our city, our county, and our State.

Gentlemen, once more bidding you a hearty welcome to our city and to our firesides, I will give room to others, who will have something more interesting to say to you.

President Lyon, of the State Horticultural Society, responded substantially as follows:

"We are always most happy to meet with those who are interested in the things that interest us. In horticulture, people of every avocation can meet upon common territory and enjoy the same fruits. Things have materially changed in our State in half a century. We have more of horticulture now than fifty years ago, to engross our thought, our sympathies, and our interests. Fifty-five years ago I landed in Detroit, a city of two thousand people. The Lower Peninsula was all of our present Michigan that was then known, and most of that was a "howling wilderness." The manufacture of salt, and even lumber, was unknown in the Saginaw Valley. The Indians held full sway. Now look about you. Your beautiful city is nestled down in the border of the Saginaw Valley. On every side are smiling fields and fruitful orchards. The improvement has been rapid and healthy. And now that the face of your country has been prepared for the most progressive agriculture, it is certainly appropriate that a good measure of attention be given to the objects which our society has in view—leading toward which, we believe that progress will make toward a higher improvement.

In Europe the civilizing processes move slowly; in Asia more slowly still. When one wants to find his ideal of energy and progressive movement, let him seek it in young America, and especially in the Great West.

But what is "West?" Michigan, a half century ago, was the great west, and people who emigrated thither, were considered as going nearly to the end of the world. Friends parted with those who sought the shores of Michigan as they would with the dying. It was a month's journey from New York to Michigan—a distance that is now traversed in twelve hours. How differently the landscape strikes us now from what it did then. How changed is the occupation. The pioneer's hope was in felling the trees. Ours is in planting more trees. Then the work was prosy enough. Now we all of us delight in working at what is often termed the poetry of Agriculture. We love to become absorbed in the occupation which adds beauty to the country. We have grown from the dug-out to the beautiful dwelling. * * * * *

The fact that you have a thriving local society here, indicates that you appreciate your opportunities, and will indulge your love for improvements. Interest in the embellishment of a county or town is not a losing investment. I know of instances in my own acquaintance where the money value of the improvements suggested by a study of horticulture have been very large. The ornamenting of homes induces the best and most able buyers. But a better view than this of the beautifying of our homes and our farms lies in the more wholesome influence, better feeling, and higher morals, that grow out of it.

Prof. A. J. Cook, of the Agricultural College, was announced as the speaker of the evening. His subject was

EVOLUTION,

and was illustrated by the appropriate use of the blackboard. The following is a brief abstract of the address:

Evolution is now accepted by all the masters in science. The biologist accepts it as the physicist accepts the doctrine of gravitation. Any theory merits acceptance that harmonizes with the facts and phenomena with which it deals and best explains those phenomena. Thus judged evolution, like the theory of gravitation, the atomic theory, and the vibratory theory of light, finds ample basis for a firm foothold. Not only does this doctrine defy criticism, win credence from those best fitted to judge, but it has revolutionized science in many of its most important and most practical bearings. The cultured man then should know what this theory is, why it gains acceptance, and may well ask what relation it sustains to the Christian religion.

Evolutionists hold that all life is born of pre-existent life, generally rising from the more simple to the more complex, that God has created organisms, not by a separate fiat for each kind or species, but through ever acting laws. Some hold that this development has been by leaps, others by slow, imperceptible modifications. Others, the Darwinists, explain in part how these slow modifications have arisen. Every organic structure has planted within its very being a tendency to vary. The botanist and the horticulturist, no less than the stock breeder and the naturalist, observe this fact daily. Thus we have the sports among organisms in the garden, the forest, as well as among the animate tribes that sport in them. The field of existence is crowded—over-crowded—and those varieties which are strongest will alone survive. Lastly, the law of inheritance fixes then some strong points that enabled their possessors to win in the "struggle for existence." We see then why "survival of the fittest" and "natural selection" are terms for descent, as explained by Darwin. Nature is daily showing to the horticulturist the truth of a l these facts, as explained so graphically by the great philosopher.

The evolution of this doctrine is most interesting. Descartes in his philosophy gave the germ, the mere lichen, which, with Lamarck, developed into a blooming shrub, though unattractive. While Mathew, the floriculturist, brought out the Darwinian bloom, which failed. however, to attract the popular gaze. Darwin and Wallace left the theory a symmetrical tree, whose bloom and fragrance reached to all civilized nations. Now every scientist is pruning, grafting, mulching, etc., that this goodly growth may soon advance to perfection.

The arguments that have won such numerous adherents to this theory are: Gradation in the present life of the world, which, though presenting many breaks, is startling in its suggestive lessons; fossil forms which fill many of the breaks of our present life, and show that harmony in development and gradation has ever been existent from the dawn of the creation of life; embryology, showing that development of the individual, marks out the development of past ages; abortive organs, which are easily explained on the ground that they were once useful appendages, but have been whittled away by nature as they became useless from changed habits of their possessor; monstrosities, which are generally or often the growth of these abortive organs referred to above, by added nutrition, so that they appear as their representatives in the past appeared; geology, which shows the life of each continent in any geological age to be modeled after the life of the same continent in the preceding geological age; and modifications, as seen to-day, which follow upon a changed condition of the plant or animal which are so striking, that were the history of the cases obscure, these modifications would be considered abundantly sufficient to separate the forms, as distinct species, or even more distant groups. These variated differences, even in nature, are so striking that the students of birds and mammals have reduced the species of the older naturalists from one-third to one-half. The same species in Kansas and Michigan are wide apart in appearance. Naturalists have learned that varieties, species, and even the wider groups, as genera and orders, have only quantitative differences.

Lastly, educated Christian men are no longer halting tremulously before this theory of creation. It demands a God. It is not antagonistic to theology. Our first commentators on the scriptures are accepting it. Our most devout Christian scientists, like Dana and Gray, accept evolution in science and the Bible in ethics. Our great divines, like McCosh and Beecher, recognize the truth in evolution and hasten to turn it to use as a great factor in moral progress.

The Bible proclaims God to be the great creator of all. Evolution shows in part the methods of creation, on which point scripture is silent. Both evolution and the Bible assert that the fittest survive, and urge with strongest emphasis towards a life of purity and excellence.

Tuesday Morning.

The exercises were opened promptly at the morning session by music furnished by the high school, conducted by Prof. Gass. Prayer was offered by the Rev. A. W. Seabrease. The first paper of the morning was by W. Z. Hutchinson of Rogersville, on

BEES IN THEIR RELATION TO HORTICULTURE,

in which he took very radical ground that bees were the friends of the horticulturist, especially dwelling upon the idea that the fertilization of the flowers of many fruits was very largely due to the bees' exertions in collecting honey therefrom. He gave instances within his own observation of the influence of bees in fertilizing fruit blossoms, speaking especially of the cherry. He refuted the notion that bees attack grapes and destroy the symmetry of the branches, or in any way act against the vine grower, saying that when once a puncture has been made the bees clean out the grape, preventing decay, and are thus a real help to the grape grower. [See Secretary's portfolio for full text of this paper.]

After the reading of the paper, the chair announced the following committees:

Fruits—P. C. Dempsey, Trenton, Ontario; J. J. Parshall, Ann Arbor; J. J. Atherly, South Haven.

Vegetables—C. B. Stowell, Hudson; R. Graham, Grand Rapids; H. W. Davis, Lapeer.

Plants—W. J. Beal, Lansing; E. LeValley, Ionia; J. J. Atherly, South Haven.

Resolutions—H. W. Hilburn, Arkona, Ontario; O. R. L. Crozier, Ann Arbor; C L. Hoag, Lockport, N. Y.

Jellies, Dried Fruits, Etc.—B. Gott, Arkona, Ontario; Mrs. A. L. Aldrich, Flint; Mrs. Passmore, Flushing.

FERTILIZATION BY INSECTS, ETC.

Mr. Hutchinson's paper was taken up, and the following discussion, somewhat irrelevant to his subject, ensued:

Prof. Beal: Mr. Hutchinson's subject was a very proper one to be brought up at this meeting, and was well treated. In many instances the work of bees in fertilization is very plain. In some plants we can supplement their work with excellent practical results. Prof. Tracy and others have increased the crop of squashes and melons by carrying the pollen artificially from the male to the female blossoms. I am somewhat yet of the opinion, however, that the case of the lack of fertilization of cherries, spoken of by the essayist, can be accounted for in other ways; because cherries, in truth most members of that family of plants, are naturally fertilized quite completely without the aid of insects. Some years the flowers fail to produce good styles or stigmas; and again the anthers are defective. Impotency is quite common in the vegetable world. There is no doubt in my mind however, that cross-fertilization is a step toward fruitfulness. I at one time crossed twenty-four apples upon a tree with great care; it proved to be an unfruitful year with that particular tree, only twelve apples maturing; but nearly every apple that perfected itself was of the number cross-fertilized.

The question of bees injuring grapes is yet a debatable one; still it seems to me from some very careful experiments performed by competent men that the bees have been somewhat maligned.

C. L. Hoag, Lockport: The artificial crossing of flowers is very easily performed in a great many cases; still a very careful and honest experimenter should do the work. We have done a good deal in crossing grapes at Lockport, and have very little difficulty. The one thing to secure in this case is the impossibility of insect intervention, by carefully bagging the flowers to be crossed and using the pollen which is desired. It is quite wonderful how long the pollen can be preserved and retain its fructifying qualities. It has been kept eighteen years in perfect condition.

Prof. Beal: I have kept pollen some time and used it with success, but have no experience that would corroborate the last statement of Mr. Hoag.

President Lyon: I take this opportunity to state that latterly I have made something of a specialty of observing strawberries, and have yet to find a variety that is strictly pistillate. The blossoms of those varieties, so-called, range all the way from having almost no stamens to flowers with a perfect set of the male organs.

Mr. Beecher, of Flushing, inquired about the details of cross-fertilization.

Prof. Beal responded by explaining the position of the male and female organs upon various plants; gave an account of how he had experimented with Indian corn; said that in strawberries crossing was very easily accomplished by simply planting the two varieties to be employed together. Mr. Hathaway, who originated the Michigan and Bidwell, accomplishes his work in this way. Grapes fertilize before the flower opens; so the cap must be removed from the blossom and the stamens carefully cut away, for the grape generally self-fertilizes. As soon as stamens are cut away a paper bag is put over the flowers, so as to prevent any pollen from entering except that artificially introduced, which should be done in a day or two, the pollen having been gathered from the parent desired and carefully placed in a corked bottle. This latter process is simple when you know that the whole stamen can be cut off and dropped into the bottle. A bursting stamen can be taken with forceps and the pollen dusted on pistil desired. The crossing of wheat and clover is a very difficult matter, and requires patience and skill. Apples are easily crossed. The flowers should be visited before they open and the twenty stamens carefully cut away from the central blossom in the cluster of blossoms that grow together; remove also the blossoms that are near the one to be manipulated, and in a day or two touch the five little stigmas of the flower selected with the pollen from stamens desired to be used. The work is done very readily, and apples are about the best fruit for a novice to begin on.

Some one inquired of the professor if changes in the character of the fruit were readily secured the first year by crossing.

Prof. Beal: In some things change is effectual the first year. Corn is an illustration. In the Cucurbitaceæ we often learn of changes worked the first season, by the influence, say of the pollen of a pumpkin upon a squash, a squash upon a melon, etc. But many varieties in fruits, noticed and attributed to crossing, will scarcely be satisfactorily accounted for upon that theory. Often peculiar russet stripes are formed upon smooth red apples, and people say they are caused by the pollen of a Russet apple having fallen on one of the stigmas of the blossom. Dr. Gray, in commenting upon this popular notion, refutes it by showing that the russet stripes are not limited, by the lines which divide the different parts of the apple represented in the blossom, by one style and stigma with its corresponding part of the ovary. I think these russet stripes are simply spots, like a varigated branch on a fuchsia or geranium. I don't believe the pollen in crossing will affect the immediate fruit, but experiment may convince me to the contrary.

Mr. Leland asked if we might always expect, as a result of crossing, an influence upon the seed that would go down through the generations thereafter.

Prof. Beal: I suppose we may be as sure of this influence in plants as in animals, only we are, on account of difficulties, more liable to make mistakes.

J. N. Stearns, Kalamazoo: It is generally supposed that the fruit is immediately affected. In my own experience with melons, I find ample proof of this. I planted a particularly good kind of watermelon away from all other melons, but directly ending a row of Hubbard squashes. The influence upon the fruit of the melon vines nearest the squashes was quite noticable in flavor and appearance, and I must say the melons were not improved.

Prof. Cook: I suppose we ought all to recognize the belief among the most careful scientists that the honey in plants is secreted for the highest good of the plants, and any ideas that are based upon the pretty conceit that the honey is placed there for the support of the bees is mere sentiment. Honey in plants is not always confined to the flowers, but is found upon other parts of plants, as illustrated by the glands on the side of the cotton plant and cow-pea of the south.

P. C. Dempsey, Newton, Ontario: I have experimented a good deal in glass houses with crossing, and find it far more easy to obtain satisfactory results, because of the absence of wind and insects to perturb the experiments. I have made very careful observation concerning the work of bees upon grapes, and am satisfied that in our vicinity the Oriole, with its sharp bill, is the destroyer. He sucks the juice and leaves the pulp, and is never satisfied.

Secretary Garfield: We sometimes see the results of crossing when we least expect them, and we can never know from the appearance of seed that it has not been so affected by its parentage, as to produce in its progeny great surprises to the grower. As an instance of this, let me relate a bit of experience. Two years ago I had given me by a friend in this county of Genesee, a beautiful ear of popcorn. I thought for a small corn it was the most nearly perfect of any specimen I had ever seen. I planted it the following season away from all corn that blossomed at the same season, so there was no possibility of crossing, but when I harvested the crop I found that there was in its progeny an exhibit of the influence of certainly three distinct parents. There were ears of Sweet corn, Dent corn, and Smut-nose corn, and all grades between them, and rarely an ear that had any likeness to the ear from which my seed was shelled.

Mr. Dempsey related a ludicrous incident of the fertilizing of a watermelon by a pumpkin, and the progeny was improved so much in size and general appearance, that when entered as melons at the fairs they universally took first premium. [The viewing committees evidently "guessed the pulp before they cut the peel." SEC'Y.]

C. B. Stowell, Hudson: I have had cucumbers influence muskmelons the first year, and the muskmelons were no better for it either. Occasionally in my Hubbard squash field I find a specimen that has every appearance of some other named variety, although I have taken great pains to maintain the purity of my stock. Have thought that possibly some insect had come from a long distance with a bit of foreign pollen hitched to his carcass that did the mischief. I planted rice and yellow popcorn near each other last season, and saw no effect, but from the seed planted this year I have all the gradations between the two that can be well imagined.

C. L. Hoag, Lockport, N. Y.: I had an illustration of immediate influence upon the fruit last year. Carefully saved seeds from pure Cuban Queen melons and Hubbard squashes, were planted in same row. The melons were rendered valueless by juxtaposition.

Mr. Leland: Is it not true that some sorts of corn more readily mix than others?

Mr. Stowell: I had supposed that this was true, and resulted from difference in time of blossoming.

Prof. Beal: Yes, the varieties must blossom at the same time to produce a cross, unless done artificially by saving the pollen.

Following this discussion Mr. A. L. Aldrich gave the following very valuable paper on

HORTICULTURAL STATISTICS OF GENESEE COUNTY:

Mr. President, Ladies and Gentlemen: The task assigned me by your Secretary, namely, that of compiling the horticultural statistics of Genesee county, has proved somewhat more formidable than I had anticipated. There are no records covering any part of the subject available in the County Clerk's office, and there is nothing that would materially assist one in the search for such information in the office of the Secretary of State, at Lansing. Such facts and figures as I have been able to collate are derived from original sources, and while some of them are based upon estimates instead of reports, the most of them are furnished by the persons directly engaged in the cultivation of horticultural products, or in the purchase and sale of them. In all cases they are absolutely accurate or approximately so.

Classifying the horticultural products of the county in the order of their relative importance or cash value, I begin with

APPLES.

The time allowed for the preparation of this paper was too short to permit me to visit, in person, even the different townships of the county, not to say individual owners of orchards, to obtain an actual count of the acreage of apple orcharding, but through the assistance of Hon. A. S. Partridge, Mr. N. A. Beecher, Mr. C. F. Rosenkrans, Mr. Reuben Carman, and Mr. Leonard Wesson, of the Genesee County Horticultural Society, and sundry other well informed gentlemen, I have been enabled to make estimates upon the amount of bearing apple orcharding that are believed to be substantially correct.

According to reports from the office of the Secretary of State, the area of wheat grown in this county in 1882, was 50,127 acres. Estimating that there is one acre of apple orcharding for every twenty acres of wheat, and there would be, in round numbers, 2,500 acres of bearing orchards within the limits of Genesee county.

There are ten points in the county at which apple packing is done on a more or less extensive scale, namely: Flint, Fenton, Linden, Swartz Creek, Davison Station, Mt. Morris, Clio, Geneseeville, Rogersville, and Grand Blanc. The shipments from these several places, the present season, are as follows:

Places.	Bushels.
Flint	30,000
Fenton	5,000
Linden	2,625
Swartz Creek	2,700
Davison Station	2,500

Places.	Bushels.
Mt. Morris	10,500
Clio	3,500
Geneseeville	500
Rogersville	3,000
Grand Blanc	2,500
Total	62,825

But this is not all, or half. It is safe to say that of the apples fit for shipping, at least twenty-five per cent are still in the hands of the producers, a part of which will of course be retained for home consumption, and another portion will yet be brought to various shipping points for sale. Adding this amount to the shipments already made, and it swells the aggregate to 78,500 bushels.

I am informed by the shippers that the price paid for these apples will average about sixty cents per bushel, which would give, as the actual cash value of this portion of the apple crop for the current year, $47,100.

There are within the county three quite extensive establishments for carrying on the process of evaporating apples. One of these is located in Flint, and two are at Fenton. The aggregate production of all these factories is fifty tons of evaporated apples, made from 20,000 bushels of green apples. The aggregate value of the products of these factories is about $16,000.

There are in the county nine factories for making apple jelly. The total amount of jelly made in these the present year is 13,000 gallons. In the production of this jelly there were used nearly 32,500 bushels of apples, of a grade somewhat lower than those used in the evaporating factories. This jelly has a market value of seventy-five cents per gallon, or a total of $9,750 at wholesale.

There is a very considerable business in the county in the manufacture of cider, there being eleven mills of a daily capacity of 1,500 gallons or more, besides some smaller concerns. In these various mills about 91,000 bushels of apples have been converted into cider, making an aggregate of 283,000 gallons, or 9,126 barrels of this liquid, worth at least $25,000.

At the various evaporating establishments of the county, one of the products is vinegar, of which 600 barrels are reported to have been made. This product at present prices has a commercial value of about $2,000.

Bringing these money totals together, they are as follows:

Green apples	$47,100 00
Evaporated apples	16,000 00
Apple jelly	9,750 00
Cider	25,000 00
Vinegar	2,000 00
Total	$99,850 00

As the cash value of the apple crop of Genesee county for the current year.

If my estimate of the acreage of orcharding is correct, there are, assuming forty trees to the acre to be the average, about 100,000 bearing apple trees in the county, and the value of the crop this year is shown to be about one dollar per tree. This income would pay the interest at seven per cent on a trifle over fourteen dollars. An acre of bearing apple orcharding is therefore worth, at that rate, $560. The entire acreage of orcharding in the county has a value of $1,400,000.

But the crop the present year is acknowledged to be much below the average, and it is fair to assume that the average income from the apple crop is not less than $125,000 to $150,000 per annum, thus making every acre of orcharding worth from $720 to $840, and the total orcharding of the county worth from $1,800,000 to $2,000,000.

It does not require a great deal of penetration to perceive that a well-kept apple orchard located in this county is a good piece of property. Others seem to have made a practical use of this inference, and I gather from the various nurserymen and others engaged in the sale of fruit trees, that at least seventy-five acres of new orcharding have been planted in the county during the current year.

I think it is not beyond the province of this paper to say that twice or even five times the amount of apples produced in this county this year could easily have been marketed in some form or other with profit to producer, manufacturer, and shipper. Genesee county apples, green, find their way as far east as London and Edinburgh, and as far west as Dakota and Manitoba, while the evaporated apples, jelly, and vinegar, have even a wider range of profitable markets, reaching to Germany in the east, and to Montana and Wyoming in the west.

PEACHES.

Peach culture is not at present carried on to any great extent in this county. A few years ago, the late Samuel Day, of Linden, could pick and market 2,500 bushels of peaches in one year. The late severe winters have proved to be destructive of the trees in a large measure. There are, however, in Fenton township, about fifty acres of bearing peach orchards, which, no doubt, comprise fully one-half of the trees in the county. There were about 200 bushels evaporated, the poorer varieties, of course. I do not believe, from all the information I can obtain, that more than 1,000 bushels of peaches have been produced in the county. The value of the crop may be placed at $3,000.

PEARS

Are not cultivated on a large scale in this county, but judging from the success achieved with pears by Mr. Leonard Wesson, of this city, who has about 150 trees of the best varieties, I am inclined to believe that our fruit growers are neglecting a very profitable source of income. Mr. Wesson's pear orchard, in the fruiting season, is a sight to charm the vision of the pomologist. The trees are ideal in form, thrifty in growth, and no pears could be more absolutely free from defects as to contour and color than those produced by these trees. I mention these things to show what intelligent forethought in selecting and planting varieties, and subsequent scientific cultivation, will do in the production of pears in this county. Half of Mr. Wesson's trees are dwarfs, and are in full bearing, the standards not having attained to that condition as yet. These dwarfs occupy less than half an acre of ground, and they produced last summer forty bushels of pears, which sold for $2 per bushel, or a total of $80—at the rate of $160 to the acre; a fair income from an acre of land. This would pay the interest on $2,284 at seven per cent. Standards, in full bearing, will yield five bushels per tree, which, at the above quoted price, would give a net profit of $1,000 per acre, after paying all the expense of cultivation, picking and marketing.

PLUMS AND CHERRIES

Are cultivated on a small scale only, and principally by farmers for their own use. The production of cherries is pretty large, but I have no statistics in that line whatever. That the cultivation of both these fruits might be made very profitable here, admits of no possible doubt. Indeed, now that the curculio pests can be successfully combated, I believe, from the crops produced upon isolated trees, that the cultivation of plums might be made highly remunerative here.

SMALL FRUITS.

The cultivation of small fruits is beginning to attract considerable attention here, and the business proves remunerative. I know of one strawberry field less than four miles from this city, having an area of one and one-sixth acres, which last summer produced 8,000 quarts of berries, at a total cash value of more than $900. The shipments from Clio, by express, were 150 bushels, valued at upwards of $500. The acreage of strawberries is small, and the total value of berries produced in the county for market will not exceed $3,000. The cultivation of raspberries and blackberries is on an exceedingly small scale, but it is growing, and is destined to become an important element in the horticulture of the county.

GRAPES.

The cultivation of grapes is also getting to be a rather important local industry. There are about twelve vineyards in the county, ranging in area from one acre up to ten acres, and the total acreage is about forty acres. This estimate does not include the small graperies to be found in great numbers in this city, in the villages, and on many farms through the county.

The total yield of grapes in the vineyards proper for this year would probably aggregate seventy-five tons, valued at $50 per ton, a total of nearly $4,000. Perhaps the amount grown in gardens for home use would be half as much more. During the present season, about 2,000 gallons of wine have been made in the county, and producers tell me that there is more profit in producing grapes for wine than for market, when prices fall below $50 per ton. The wines made from Genesee county grapes rank as high perhaps as any Michigan wines, and the manufacture of that liquid is likely to become quite an important element in the future horticultural history of the county. I doubt if there is any part of the State better adapted to the growth of the hardier varieties of grapes than Genesee county.

SUGAR CANE.

I have gathered some statistics on the subject of sugar cane culture, which I will give in the closing paragraphs of this paper, as I do not deem that topic beyond the proper province of my report. This is a comparatively new industry here, but it will no doubt grow vastly beyond its present proportions in the immediate future, as there can be no reasonable doubt of its profitableness. The production the present season has reached the large aggregate of nearly 10,000 gallons, worth at wholesale, fifty cents per gallon, or $5,000. The yield in some instances is quite marvelous. For instance, Mr. Wesson produced forty-five gallons from an eighth of an acre, or at the rate of 360 gallons per acre. This is probably considerably above the average. But if the average yield were 200 gallons, that would give a value of $100, which is a fair income for the outlay, from one acre of ordinary farming land.

MARKET GARDENING.

Until recently market gardening has not received very much attention in this county, but that branch of horticulture is beginning to assume something of the importance that properly belongs to it, and several gardens in this vicinity and at other points on the lines of our railways, not only supply our own markets with an abundance of choice vegetables, but contribute something to the supply of the Saginaws and Detroit. The business will grow as its profitableness has been amply demonstrated and notably by some of the gardeners in the immediate vicinity.

GREENHOUSES.

There are two greenhouses in this city—the only establishments of the kind in the county, I believe. One of them has been in successful operation for a number of years, but it has not been able to supply the growing demand for flowers and plants, even in this city, to say nothing of that existing and constantly increasing in neighboring cities. To meet this demand, another has been built on a pretty extensive scale during the past summer, and is now in successful operation—so successful, indeed, that I am informed that even it is not able to supply the want that exists right at home.

I am glad to mention these things as evincing a constant growth in refinement and culture among our people.

Perhaps I cannot better conclude this paper than by recapitulating some of the foregoing figures. The table would stand thus:

Value of apple product	$99,950 00
Value of peaches	3,000 00
Value of pears, cherries, and plums	3,000 00
Value of small fruits	3,500 00
Value of grapes and wine	4,000 00
Value of cane syrup	5,000 00
Total	$118,450 00

N. A. Beecher: The paper by Mr. Aldrich is one of the most valuable to our horticultural interests ever read in our county. We have put in concise shape here facts that will show the world that Genesee county, Michigan, can do something worth recording. The refuse apples in our county aggregate in value a large amount. Perhaps they are not all utilized, in truth, I know they are not.

Solon Robinson once remarked that apples were the cheapest kind of swine food. I heartily agree with him, and know that on some farms in this county the refuse apples could be made to add more than a hundred dollars to the receipts of the farm.

Mr. Aldrich: One item I neglected to mention, which is worth recording; I refer to the article of apple butter, of which there were 300 gallons, worth $300, produced at Flushing. Mr. Wilcox, of this city, made some of this article in 1881, none in 1882, but will make it on a larger scale next year.

A. S. Partridge: Very few people know that there is by act of the Legislature of 1881, a bounty of two cents per pound on pure sucrose sugar produced in the State between the years 1882 and 1887, with the proviso that a full account of the processes of manufacture shall be furnished the Board of Agriculture for publication, by any one securing the bounty. Wherever corn will grow, sugar-cane will grow and mature; even in poorer soil than corn needs to develop a good crop, from 160 to 200 gallons of good syrup may be produced from a single acre; and from a good syrup produced from Amber cane, five to six pounds of sugar may be made per gallon. The cane is good cattle food. We want a pure sweet, and I believe in our county and State this branch of industry will rapidly grow in favor.

H. W. Davis, Lapeer: I believe Mr. Aldrich's statistics are all right, but think that there is danger in estimating the value of a full crop by the net income of only a partial crop. My experience in buying fruit for drying this season is that in many instances the orchards net as much money with a light crop as they did last year with a heavy crop.

C. T. Rosenkrans: I have had a considerable experience in growing and marketing apples from a farm, and am fearless in advising, from my experience, to plant more largely to orcharding. A man with forty acres should, within a reasonable distance from market, have one-fourth of it in orchards. I handled forty cars of apples at St. Paul two years ago, and found the markets very high, but freights were correspondingly high when shipments were made west of St. Paul. But the moment we put enough fruit in the way of going over those roads, we shall get better rates, and find a market with good margins for every apple we can grow.

Following this discussion Mr. C. T. Rosenkrans read the following essay upon

FIVE BEST VARIETIES OF MARKET APPLES FOR EAST MICHIGAN:

In accepting your invitation it is with a conviction of my inability to do this subject, assigned to me, justice, but being a member of this society, I will throw in my mite with the rest. I shall not spend any time suggesting any early varieties for market. We have the Tart Bough, the Red Astrachan, and Fameuse (or Snow), and many other varieties that I might mention, but the Southern States can raise early apples and put them on the market so much earlier than we can that we fail in competing with them. I would not advise setting any more early fruit than enough for home consumption.

My first choice of winter fruit is Canada Red, which, I think, is the old Nonesuch, of Massachusetts, or Steel's Red Winter. Its size is medium; color, red, and it is crisp, sub-acid, tender, and when fully matured, delicious. The best orchard I ever saw of this variety was owned by Mr. W. Tafft, of Wayne county, near Plymouth. He set out the natural fruit, and when they had been set out two years, he cut them off just below the top and grafted them. When I was there the grafts had been set eight years, and had made a very fine growth of wood and hung very full of nice fruit. I noticed that one side of the top had more fruit on than the other, and I called Mr. Tafft's attention to this. He said that was a trait of the tree, and that the next year the side that had the smallest amount on would bear full. I have a small orchard of this variety of 120 trees that were root grafted; they were very small, poor trees, when I set them, but they have made a very good growth. They have been set ten years, and a great many of them will measure five or six inches through. If this variety is properly picked and packed they will keep till June.

The Baldwin, which originated in the State of Massachusetts, is large, roundish, deep bright red, juicy, good flavor; tree vigorous, upright grower, and very productive. This variety has been generally condemned on account of its failing to stand our cold winters, but it has always stood the winters, except that of 1875. I think if it were grafted in some hardy stock we should be able to grow a hardier tree. This variety should not be grown too fast; never cultivated more than two years; then seed to grass, then mow two years, leaving the aftermath on the ground. A great deal depends on the pruning of this variety to make it hardy; if the tree is a large thrifty one when it is set, and the center limb in the top is taken out when the tree comes into bearing, the center will begin to rot, then the limbs begin to drop, and soon your tree is gone.

The Northern Spy originated in the State of New York. It is large, roundish, slightly conical, somewhat ribbed, striped, with the sunny side nearly covered with red; it is mild, sub-acid, rich, and of delicious flavor, being one of our best dessert apples. My experience with this variety is that it is a very tardy and uneven bearer, and the fruit rots very badly on the tree. When young, the tree is a good grower and very hardy. I am not in favor of pruning apple trees with any instrument much larger than a pruning knife, but this tree might be an exception, the top growing very compact.

The Rhode Island Greening is generally called the chief of cooking apples, and it also stands high for dessert or market, but the skin is rather tender for shipping, showing bruises badly. Two years ago I met a dealer in Milwaukee who wanted one thousand barrels of apples, and wanted them all Rhode Island Greenings. The tree is a thrifty grower and very hardy; limbs are inclined to grow to the ground. The outside limbs should be trimmed off. Avoid setting crotched top trees of this variety. It has generally proved productive, but it has not proved so with me. With good care it will keep till March.

The Golden Russet is one of the finest varieties grown in this part of Michigan. The tree is hardy, a thrifty grower, and a good bearer. The fruit is medium size, dull russet with a tinge of red on the exposed side, flesh rich and highly flavored, and will keep till June. If you want some very fine apples for dessert in the spring, select a barrel or more of this variety, roll them up in a paper as you usually see oranges, and pack them in a tight barrel. Put them in the cellar until ready to use, and you will have some Michigan oranges.

The hour having arrived, according to the published programme, for the

MESSAGE FROM PRESIDENT LYON.

He spoke as follows:

To the Members of the Michigan State Horticultural Society:

In presenting, at the close of the year, some suggestions drawn from past observation and experience, I trust I may be excused if I pass over the financial condition of the society's affairs, leaving this to the annual report of the Treasurer; and omit any extended statement of the operations of the past year, since this will doubtless appear in the annual report of the Secretary.

Our remarks, therefore, will take the form of suggestions or queries respecting the operations of the future, with only such references to the past as shall naturally occur in such connection.

For two years past the society, mainly through its Secretary, has been engaged in the work of promoting the formation of auxiliary societies—a work which, judging from results so far, may be expected to greatly increase its influence for good in our own State, while it has received the hearty commendation of the horticulturists of other States.

Horticulture imposes upon its devotees other duties than that of watching over and admiring flowers and fruits, and those even of less attractive character; less likely, therefore, to become "labors of love." Whether for this, or for some other cause incident to our nature, ever since Adam betrayed his primal horticultural trust, and our second father—Noah—applied the pomonal product of his garden to a questionable, if not forbidden, use, even the devotees of horticulture seem inclined to forget its attractions, and especially to ignore the past, that their interest in their chosen pursuit can be greatly strengthened by association; while from this, in common with all other pursuits, they may derive more economical and effective processes, increased knowledge, and even a wider influence of the entire class.

That these are truths to-day, is manifest from the fact that, of the auxiliaries already organized, some, at least, are far less efficient than they should be; while others are even liable to the suspicion that they are in danger of forgetting the liabilities they have assumed. There are also many localities in which there are abundant reasons for the assumption that an organization of this character, once effected, would become the instrument of great good; but where, without an extraneous influence to communicate the primal impulse, the present apathy may be expected to continue indefinitely.

In view of these circumstances, therefore, we venture the suggestion that the society consider the possibility, and the propriety, of providing for the expense of a visiting agent, or agents, on a more extensive scale than was possible while the matter rested in the hands of the Secretary, hampered as he is, with a multiplicity of other duties.

In connection with this subject we suggest that even the Upper Peninsula is by no means without horticultural capacity, to say nothing of its actual needs in this respect. We suggest, therefore, that measures be taken to promote the organization of auxiliaries in that region, and the attendance at our meetings of delegations qualified to represent them, so far as their capacities and needs are concerned.

In the conduct of the departments of the State Fair, committed to our society, the principal, if not the sole, motive urged upon exhibitors, has been the *argumentum ad crumenam*, and so far as our exhibits at other meetings are concerned, we have recently mainly appealed to the same inducement.

Recently, in the course of correspondence with the President of the Georgia Horticultural Society—P. J. Berckmans—he takes occasion to state that his society had practiced this; but, having become dissatisfied with it, has reörganized, and among other changes, had provided that no higher premium than the report and commendation of a committee, shall in any case, be offered or awarded.

We have had occasion during our connection with such exhibitions, to observe some specially objectionable outgrowths of this system of money awards, and we are confident that if the desired exhibits can be otherwise secured, especially at our quarterly meetings, a desirable point will be gained. We recommend that a careful consideration be given to the subject.

The Annual State Fair, at which our largest exhibition is held, is fixed, both as to place and time, by the State Agricultural Society, with reference to the most convenient time for all departments. This date is too early for long-keeping apples, pears, and even the latest peaches and plums.

With the exception of strawberries and the earlier cherries, the exhibition of which is provided for at the June meeting, late cherries, raspberries, currants, gooseberries, blackberries, early apples, pears, peaches, plums, and grapes, are rarely if ever exhibited in good condition for examination and the correction of nomenclature, and with the growth of the small fruit interest in our State, it becomes increasingly important that the society adopt the best practicable means to aid growers and planters in the identification of varieties, and the correction of erroneous names, as well as to familiarize them with varieties under correct names.

The society has now, for a considerable period, been designated as Horticultural. To be true to the greater scope of effort implied in this change, it should study well the new and broad field now open to it, and consider what constitutes a thorough occupancy of it.

When we contemplate the immense sum annually expended in the construction of rural homes and their surroundings, and consider how large a proportion of such cost might, by a reasonable economy, be saved and devoted to purposes of comfort, taste, and pleasure, in connection with the routine of every day life, may we not well consider how most effectually to encourage the development of correct taste in these particulars.

1. In architecture, as applied to village, suburban, and rural homes, and out-buildings.

2. In the appropriate laying out and planting of the surrounding grounds, and their after keeping.

As a means of instruction, affording useful hints of an architectural character applicable to rural homes, the inducements the society may be able to offer should suffice to induce an occasional contribution in the way of plans and estimates for residences, from even professional architects, which might, perchance, be thought worthy of a place in the society's transactions.

The same process might doubtless prove equally applicable to suburban and village residences, although the necessity in this direction will hardly be considered equally great.

Home ornamentation, both within and without the residence, may be considered as only less important than the foregoing. We here come more directly within the sphere of woman's taste, and we can scarcely imagine any step calculated to more certainly lead to success in this direction than the securing of a thorough interest and hearty coöperation on her part, in the work of impressing just ideas upon the public mind.

As a means of bringing the several branches of this subject before those especially concerned, we suggest the propriety of offering the diploma of the society for plans and estimates for a farm residence of a specified value.

For plans and estimates for a village or suburban residence of specified cost.

For plans for ornamental grounds and out-buildings, appropriate for each of the foregoing, including garden, orchards and yards.

Secretary Garfield has for the past two years devoted more or less attention to the subject of the ornamentation of country school grounds—a work in which he has been highly complimented by many, both at home and abroad. The work is of much importance, if only for the happy influence that pleasant school surroundings may be expected to exert upon the youthful mind. I suggest that, in view of the importance of the subject, he be accorded the hearty coöperation of the society, and that he be requested to indicate in what way such coöperation can be most effectively rendered.

The duties of the Secretary of this society are known to consume a very large share of his time and thoughts. Mr. Garfield has, so far, performed these duties for a consideration of only six hundred dollars per year—a small consideration for the amount and character of the labor performed; and knowing, as we do, that repeated offers of large salaries, associated with highly honorable positions, have been refused by him rather than abandon his present work, and knowing, also, that a much greater amount of time and labor is needed to fully meet the demands upon the society, we urge a careful consideration of the practicability of so increasing the consideration for his services as to enable him to devote his time wholly to his duties as Secretary, at the same time removing the temptation to leave his present position, to which he seems so thoroughly adapted, for one more tempting, because more lucrative.

The standing committees of the society, especially those on new fruits, and on revision of the catalogue, are assigned a highly important work; in the case of the latter, this is especially true. Much of the information required is only obtainable in authentic form, by actually going about the district and obtaining it from first hands. Persons may perchance be found so far interested in the subject as to be willing to devote the needful time, but few, if any, are likely to perform such duty properly when cash expenses must also be borne; nor is it reasonable that they be asked to do so.

Thus far little or nothing of this has been done by the members of such committees, beyond the reporting of such facts as they chanced to have learned. Beyond the estimated values of fruits in the several districts, and the fact of their cultivation or non-cultivation there, the labor has fallen mainly upon the chairman of the committee. We again recommend that the general chairman be authorized, in his discretion, to call an occasional meeting of each district committee, for the purpose of collecting needful information, and for the maturing of arrangements for farther collections; the expenses of the members being paid by the society.

If the society is to hold its Annual Fair in connection with that of the State Agricultural Society, the arrangement for the purpose must be effected at the annual meeting of their executive committee, which occurs early in January next. Any instructions on the subject to the executive board of this society, must, therefore, necessarily be given at our present meeting.

Affiliation between the Horticultural Societies of different States, as well as with those of broader scope, has ever proved a most effective means of developing broader views, and more effective processes for the developement, acquisition, and dissemination, of horticultural knowledge. This society has not heretofore shown itself backward in this respect; we, therefore, merely call attention to the subject, by stating the times and places designated for the regular meetings of the societies of several adjacent States, including others embracing more extensive territory.

The American Pomological Society will meet in Philadelphia, probably during the second full week in September next, as we gather from a note recently received from President Wilder. The time, however, is not yet fully determined. The time is yet so far in advance that the consideration of the propriety of sending a delegation may, very properly, be deferred till a subsequent meeting of the society.

It may not, however, be too soon to consider the propriety of renewing the invitation to that society to hold its next biennial session in Michigan. It may be proper to remark that there is reason to suppose that the coming session would probably have been assigned to our State, but for the conviction that the feeble health and great age of President Wilder would incapacitate him for so long a journey.

The annual meeting of the Ohio Horticultural Society is to occur at Chillicothe during the present week, continuing during the 6th, 7th, and 8th, of December, inst., thus including the third day of our present meeting, as shown by the circular of its president and secretary.

The annual meeting of the Indiana Horticultural Society will occur at West College Hall, Asbury University, Greencastle, December 5, 6, and 7, thus covering two days of our present session. See circular of its president and secretary.

The Illinois Horticultural Society will hold its twenty-seventh annual meeting at Kankakee, on December 12, 13, and 14.

The Wisconsin Horticultural Society has probably already held its annual meeting; since a note from one of its prominent members, J. C. Plumb, of Milton, in that State, informs me that he will be with us as a delegate from that society.

The National Agricultural Association will hold its third annual meeting at the Grand Pacific Hotel, Chicago, on December 12, 13, 14, and 15.

An excursion to New Orleans and return, is arranged under the auspices of the Mississippi Valley Horticultural Society, whose annual meeting is to occur in connection therewith, at that city, on February 21, 22, 23, and 24, 1883. Excursion tickets from Chicago, good to return within forty days, $20; sleeping car, double berths, to go and return, $6.

Parker Earle, of Cobden, Illinois, president of the society, in a recent letter speaks very encouragingly respecting the prospect for a large and interesting meeting, and is anxious to secure a large delegation from Michigan. We doubt not the occasion will be one of much interest, and that the visit to the Crescent City will afford a pleasant opportunity to contrast the icy fetters of the north with the opening spring and bursting buds of the far south.

On motion of Mr. J. N. Stearns, of Kalamazoo, the President's message was referred to a special committee named by the society, with instructions to report upon the recommendations therein contained at their earliest convenience. The convention named as such committee: Prof. W. J. Beal, Lansing; N. A. Beecher and A. S. Partridge, of Genesee county.

Afternoon Session.

The first topic for discussion at the afternoon meeting was

INCREASING THE PROFITS OF FRUIT GROWING.

Prof. Emil Baur, of Ann Arbor, was called out and said substantially:

I should say, perhaps, in an introductory way, that the Washtenaw County Pomological Society, which meets on the first Saturday of every month, and publishes the topics for discussion two weeks beforehand, had this subject of "Utilizing our fruit that otherwise would waste, and the keeping of fruit," under consideration during the early sessions of the year.

An effort was made to induce capitalists to establish canning, drying, and the manufacture of jellies, at Ann Arbor. Not being successful, some of the members, in order to protect themselves, made arrangements to accomplish the above object. Mr. J. D. Baldwin, our veteran pomologist at Ann Arbor, took the lead—11,000 cans and other fruit packages were the result of his operations. Mr. Baldwin erected a frost proof fruit house after the pattern of Mr. S. W. Dorr's fruit house at Manchester, which has proved a success so far in keeping apples and other fruit. Rev. Benjamin Day, of our society, has quite a reputation for putting up raspberry jam from the surplus of his large plantation of the Cuthbert raspberry; grape and peach marmalades, and jellies from the quince and grape, and dried peaches and apples, and raspberry syrup were the result of my own experiments.

The example of Christ in feeding 5,000 hungry people may assist us in the solution of this practical topic.

From the different records of this miracle we learn, first of all, that "Christ looked up to heaven and blessed," or gave thanks.

Fruit growers are, or have reason to be, a God-fearing people. In spite of all their efforts to do their very best in planting, nursing, and cultivating their trees, and fighting their enemies, they are conscious that, for final success, they are dependent upon Him who alone can give the increase.

Thus their very occupation leads them to look from their trees and shrubs—laden with the fruit of the earth—higher up to the giver of all good, and perfect gifts, with a heart full of praise and thanksgiving.

This, in the highest sense indeed, is an increase of the profits of fruit growing—a spiritual profit—that elevates the soul and leads the blessed man to prosperity, and to ways by which others become the participants in the blessings he enjoys.

In the next place we learn from the record of John, of this miraculous feeding: John 6:12: "Gather up the fragments that remain, that nothing be lost." Heeding this wise command of the Master, the fruit grower meets with a like success the disciples did. He finds in this gathering up of the fragments of his fruit—especially the perishable peach and other stone fruits, also the apple, pear, grape, and the different berries, an additional blessing of an economic character, of which not only he himself, but many industrious hands partake, whom he employs in this praiseworthy enterprise. He finds the gentler sex especially adapted to this pursuit of saving what otherwise would go to waste. Indeed, without her who is the best gift and greatest blessing the Creator has bestowed upon man, he could not accomplish his task. He further summons to his assistance the artisan, who furnishes him with machinery to pare his fruit, dry it, to manufacture it into jams, preserves, marmalades, jellies, in designing fruit houses, etc. From a commercial, economic, and even a hygienic standpoint, by this industry the fruit grower becomes a benefactor not only to his mother land, but of foreign countries, who import and enjoy his fruit. If it is true, that a man is what he eats, the fruit grower at once ranks with the philanthropist, and becomes an important auxiliary to the missionary societies.

In this gathering up of fragments, however, and in the manufacture of the same, the fruit grower finds his way not as smooth as might be expected. Jams and jellies, containing very little or no fruit at all, are offered and sold cheaply as genuine fruit preserves. But, with the genuine article, he will and must finally come out victorious. The American people and other nations will detect frauds. It is the business of pomological societies to bring to notice genuine fruit preserves, to encourage their manufacture, and to expose frauds.

By his example the genuine fruit grower teaches our youth two important words—saving and persevering—"sticking to your bush." By his orchards he helps to regulate the climatology of the country, counteracting the evils arising from the ruthless destruction of our forests. He plants wind-breaks by his evergreen hedges, and beautifies the landscape. The holidays are at hand. What adds more to the adornment of the Christmas tree—the joy of childhood—than the sparkling Jonathan, Red Canada, or Baldwin apple, at the sight of which the children leap for joy?

Yes, the enterprising fruit grower, in his mission of making fruit growing more profitable, will not rest until the garden of Eden is re-opened, Paradise regained; until he beholds that ideal tree of his, which not only "bears twelve manner of fruit and yields her fruit every month," but whose very leaves are utilized. The holy record says emphatically: "And the leaves of the tree were for the healing of the nations." Rev. 22:2.

Let me say in conclusion, what else can happen to him of your ranks who has thus understood and fulfilled his mission, when called to a final account, than to hear the blessed welcome of the Master: "Well done, good and faithful servant; enter thou into the joy of thy Lord?"

J. D. Baldwin, Ann Arbor: In order to make the most of our fruit crop we must look carefully to the economy of marketing. We need proper uniform packages of such sizes as will be readily detected by any one. A man buys what he takes to be a peck of peaches. He wants it to turn out a peck, and not seven quarts. We ought to deal more directly with the consumer, and not have so much of the profits absorbed by the middle men, and through defective handling, secure to the consumer an inferior article. I have gone into this matter of more direct dealing with the retailers in small towns within my reach, and have become quite well satisfied with the scheme. I know we are met with the objection that we do not know who is reliable, but I have usually got my information through the postmaster in the town I desired to place my fruit, and as yet have had no cause to regret this method. Another means of increasing profits is by erecting fruit houses. I have built one the past season, and expect it will be of great value to me in tiding over gluts on the market, as well as saving my winter fruit for late spring sales.

A. D. Healy, South Haven: In a nut-shell we can increase our profits more by cultivating better, pruning heavier, thinning more, using only honest packages, and practicing honest packing.

B. Gott, Arkona, Ontario: I think the last gentleman has just touched the root of the whole matter. The employment of careful business principles in the work of fruit growing, and marketing will ensure much greater profits than many of us get.

P. C. Dempsey, Trenton: I think we have better promises for the future than we have ever had before. Our trouble has not been to make money in years of scarcity, but to get margin enough in years of plenty to save ourselves. With our improved methods of canning, preserving, drying, and packing away, I anticipate no recurrence of the difficulties of saving money out of great crops that we have had heretofore. A surplus now means that we will not only care for it, but make money out of it.

Mr. Day, Ann Arbor: In red raspberries I see no reason for ever selling them with small margins. If the market for fresh fruit begins to drop to a figure too close to cost, make jam, which never is a drug on the market, and in which there is a handsome profit.

J. N. Stearns: In the selection of the best varieties I think lies a goodly share of our margins. We need to exercise a prophetic impulse to make the most out of our selection of varieties. There is fashion in fruits as well as in dress, and one who marks well the tendencies will plant wisely for a decade in advance of him. Good fruit, well packed and well delivered, will never cry for a market. To get the good fruit we must thin more, as Mr. Healy remarks. In my peach orchard I thinned to six inches apart, and I was surprised, after three-fourths the fruit had been taken off by this process, to find too many left, and in many instances thinned again by removing one-half of the remainder. All this because it does not pay to grow culls. Out of 4,000 baskets grown in my orchard the past year I did not have 25 baskets to throw away.

Again, we need to know more about insects and most approved methods of destroying them, to increase our profits, and perhaps I may be pardoned again for referring to a bit of my own experience. I have been troubled greatly with *curculio*, and the past season tried the following remedy with excellent success:

I placed a pint of crude carbolic acid in a pail of water, and with this slacked quick-lime until it was in a powder; this, with a wooden paddle, I cast into the trees, and had no rose-bugs nor *curculio* when it was employed.

Prof. Cook: I am glad some one has had success with this remedy, for I had it in my mind that it would prove successful, but upon trying it I found the *curculio* only laughed at my pains and continued their work of destruction as before.

B. Gott: It seems to me that the matter of cultivation is a large factor in the profits of fruit growing.

Mr. Rosenkrans: Possibly it may not be out of place to tell how I make money in orcharding. I cultivate according to variety. We can not force the Baldwin, and it is one of our best market sorts. In picking, I use small boys in the trees a good deal, who pick in bags and hand down to men who carefully place in barrels. I take the barrels into the barn toward the close of September, leaving the doors open nights and closing them daytimes, until quite cold weather, when they are transferred to the cellar.

Mr. Stearns: It seems to me safe to cultivate any variety until July 1st thoroughly.

Mr. Leland: You do not live as far north as we; if you did, you would undergo a change of mind upon this subject.

Mr. Rosenkrans: In different locations we need to deal differently with our orchards. I find even in our own county the same method of culture will not answer everywhere. I meant to have remarked before that my experience leads me to believe it disastrous to cut out the center of our trees in this climate and open the tops.

Mr. Green, Eaton Rapids: I have derived more profit in 30 years from the Baldwin variety than all others combined.

Mr. Stowell: In southern Michigan Baldwins are shipped by the thousands of barrels; nine-tenths of the apples shipped are of this variety.

N. E. Smith, Ionia: I have all the leading varieties, but the Baldwin beats them all. One-half the trees planted in Ionia county are worthless for profit, and it is not economy in our climate to top graft large trees. For profit we want a good red apple.

E. H. Scott, Ann Arbor: Red Canada needs a good deal richer soil to ensure success than the Baldwin.

Mr. Healy: If you want something to please the eye grow the Ben Davis.

S. W. Dorr, Manchester, explained the working of his fruit house; said there was money in it. The Baldwin was the apple for profit if a fruit house is used.

Mr. Collar, Adrian: One wants good trees to start with to insure profits, and wants his land prepared for its work of producing fruit; better burn poor trees than to plant them; better not start at all than to start wrong.

The President announced that the time had arrived for the next subject:

THE WAGER PEACH.

Mr. H. W. Davis, of Lapeer, read the following essay upon the topic:

Mr. President, Ladies and Gentlemen: My attention was first called to the Wager peach by the following article, which appeared in the Rural Home, of Rochester, N. Y., in the month of September, 1879.

Explanatory to reading it before you, allow me to state that I then represented in the Saginaw Valley a Western New York nursery. I had discovered that very few, if any, budded peach trees were successfully grown there, but that seedlings were hardy enough to stand the severe winters, and were bearing, as a rule, quite fair crops.

It was plain to be seen that if the Wager would certainly reproduce itself as a seedling, and was the hardy, productive, fine flavored, desirable market and canning peach, that these testimonials claimed for it, it surely would prove *the* peach for the million in that low country.

This communication, as you will see, is from nurserymen to the editors of the Rural Home.

Editors Rural Home: We send you this day, samples of our Wager peach put up nearly as they run from the tree, large and small. The fruit is rather smaller this year than last, on account of the fearful loads the trees are carrying, as no variety with us is as large as last season. This is no new variety, but has been grown in our county (Ontario), many years, and is noted for its hardiness and sure bearing qualities, having borne very heavy with us when all other varieties have failed. The fruit shows for itself. Hoping they may reach you safely, we remain

Yours truly,

Honeoye, N. Y. A. R. & L. Pennell.

They did reach us safely, as they could hardly have failed to do, so carefully were they packed, and we enjoyed an excellent feast upon them. They are rather above medium in size, of a creamy yellow color, firm flesh, small pit, and a very pleasant, agreeable flavor, suggesting that of the apricot. We learn through an old Ontario county peach grower, that the Wager will perpetuate itself through its pit, but does not always transmit its season, and so its progeny, although alike in all other characteristics, ripen all the way from August 20th up till killed by frost. That habit must render it a very convenient peach in connection with its certainty of bearing. When other peaches fail, seedlings of this variety might give you peaches all through the season.

We copy a few of the many testimonials sent us by the Messrs Pennell:

I have known the Wager peach about thirty years, and have grown it for the past twelve years. It is a very hardy variety, and has borne fruit some years when all of my other kinds of peaches have failed. It is superior for canning and table use to any other kinds I know of. E. H. CROWELL.

I have known and raised the Wager peach for over forty years, and I consider it to be the hardiest peach ever grown in this section of country, giving us regular crops every year, and is the best peach for market and canning that I ever saw. It brings about 50 cents to 75 cents more in the market than any other variety. E. R. MATHER.

I have raised the Wager peach for eight years and the trees have never failed of bearing except one year when the late frost in April killed all the fruit buds. I consider it the best peach grown in this section for canning, table or market use; a regular bearer and of the best quality.

GEO. W. BRIGGS.

In regard to the Wager peach I can state from personal knowledge as I have grown it and handled it more or less for the last twenty-five years. Also was well acquainted with Benjamin Wager and his orchard, the one that brought the seedling into Ontario county over sixty years ago; as a bearer it excels any other variety that I ever raised or handled; it is also a very hardy grower; in canning it retains its beautiful flavor and form more so than any variety, not excepting the early Crawford. For market I could always get double the orders for that variety than any other, especially after I had filled the first order. It is a very fine peach to ship; even after it has matured to its beautiful orange color it will not bruise like other varieties. A. W. RICHARDS.

I have known the Wager peach for ten years, and have raised the trees six years, and they have borne heavy crops of peaches every year, and my other varieties have failed three years out of the six. I picked from my 150 trees of Wager variety in 1877, 350 bushels, and in 1878, 300 bushels. I consider the Wager peach to be a regular and heavy bearer, more liable to overbear than not to bear enough, in which case the fruit is not so large, but of good quality. It is the best canning peach ever grown in this section of country, and always brings in the markets from 50 cents to 75 cents a bushel more than any other varieties. ANDREW BRAY.

I have known of the Wager peach twenty years; consider it the best peach we have for canning, and a good peach for market or for eating. I have about ten other varieties, and consider the Wager the hardiest of them, and as good as any of them for any purpose. O. C. CHAPIN.

I have had the Wager peach tree in bearing some eight or nine years, and it has never failed of a crop of fruit since it commenced bearing. The hard winter of four years ago killed many of my other varieties, even seedlings, but the Wager was not injured. The tree is liable to overbear, in which case the fruit is inferior, but properly thinned out, it is of fine quality. Good for marketing and excellent for canning, the flesh being very fine. I rank it of fine quality. HIRAM WILCOX.

I determined to investigate this peach.

During the winter following I wrote each of the parties above named, and from them received full corroboration of their statements in the testimonials.

In the spring succeeding, being at Rochester, I called upon Mr. Richards, and found him a plain-spoken, well-to-do, retired farmer, whose statements I judged could be relied upon.

He told me he had grown the Wager peach, for 25 years or more, from pits, first given him by Mr. Wager himself, who then stated to him that the peach would reproduce itself from its pit. He said he could hardly believe such to be a fact, but that his experience with it, through the many years since, had verified the truth of Mr. Wager's assertions. He further said he regarded the Wager peach as being all his testimonial had claimed.

He then had a few more than one hundred one-year Wager seedlings, which he had grown from selected pits, taken from his own orchard at Miller's Corners. These I purchased and brought home to Lapeer, setting them in nursery rows, first pruning the roots fully one-third, and trimming the stem to a single whip 18 inches from the ground. They were then from ⅜ to ½ inch in diameter at the base.

The young trees made such a remarkable growth during the summer, that being east again in August following, I hunted up Miller's Corners, to find, if possible, the spot where the peach originated.

Alighting from the cars the old Wager farm was soon pointed out, and there, upon a side hill, was found the orchard Mr. Wager had set, his neighbors said, something over twenty years before. The trees were thickly imbedded in sod, and had been badly cared for, Mr. Wager having been dead eleven years. The *fruit*, however, in taste, color, and form, was, by comparison, identical with that of a Mr. Taylor near by, who had 38 Wager seedling four years from the pit, in their second bearing year, now over-loaded with fruit, from which he estimated he would pick 100 bushels. He told me the trees were seedlings from pits taken from the Wager orchard. I purchased two bushels of his peaches, had them canned, and must say they have proved as fine flavored and palatable as any peach I have ever eaten.

The hundred Wagers, which had been set in nursery rows, had, by the last week in August, made such a rapid growth that I cut them back nearly one-half to thoroughly ripen the wood, and without any protection whatever they stood our severest winter of 1879–80, the thermometer indicating from 22 to 26 degrees below zero, with none frozen save two, which had not been headed in, of which some of the more tender branches were killed part way down.

The spring succeeding, not being ready to set them in an orchard, I again cut them back to one-fourth of the previous season's growth. They were then from ⅞ to 1¼ inches in diameter at the base.

During the summer, which was very dry, they made a strong, healthy growth, and in the last week in August, as before, one-half of it was cut back.

A week or so earlier than this, having a few hundred plum stocks, and thinking to produce a still hardier tree, as well as one the fruit of which, would still reproduce itself from the pit, I inserted the Wager buds in them,—both trees and buds experienced no inconvenience from our past winter.

Last May, the one hundred then three-year old trees were transplanted into orchard rows, one rod each way. One peculiarity I then noticed was the number and length of lateral roots, and great quantity of fibers, as some of them required a hole six feet in diameter.

Desiring more of the Wagers, I wrote the Mr. Taylor above referred to, for one hundred and fifty, if they were one-year seedlings from the pit, and asked him to state if they were so grown, also if there was any doubt in his own mind, as to the perpetuity of the peach through its own pit. In reply he sent the number ordered, and said *verbatim*: "These trees were grown by myself from the Wager peach pits, and the peaches grew on trees I raised from the pit, and know they will produce themselves. The first pits I got came from the old Wager trees, which were set out twenty-five years ago, and bear almost every year now. My father grew the same before me, and there is no doubt as to their reproducing themselves."

Of my three-year olds, not one has died. Of the one-year, six failed to grow. None were mulched or watered save when set. Both have made as fine growth during the season as one might wish.

Those budded on plum stalks have done even better than the seedlings, some growing five feet ten inches in height, throwing out a dozen main branches, a few of which are three feet in length, and the wood is ripened to the tips.

In conclusion, I may say, that the Wager as a tree, in the ease with which it may be grown, its surety of living when transplanted, its strong, healthy growth, and great hardiness, has proved with me all I desire of any peach. To be sure, my trees have not fruited as yet, but are now set with fruit buds. I do not doubt the veracity of the gentleman from whom my information has been obtained, and having seen and eaten the fruit in the original orchard, also other reproduced from it, I cannot believe but that mine in Michigan will prove the same; at least my faith is strong to the extent of six hundred trees.

Two years since there was not a Wager listed from the larger Western New York nurseries; now they are sending them out, budded as a new peach of great promise.

To you who may wish to try it, allow me to reiterate the words of warning given lately by one of our prominent horticulturists. He says: "We advise great caution about buying the Wager peach, if you desire to get not only the genuine but natural trees from the pit, that reproduce the same from the pit. A yellow meated peach grown in the county in which the Wager originated is being sent out as the Wager, which we now have good evidence is not that sort, and further, the Wager has been budded into natural trees, and is being sold as 'genuine Wager,' which they were, but being budded into natural seedlings, the pit from said trees will not reproduce the same once in fifty times. So if you wish to get the trees that will reproduce the genuine Wager, be cautious of whom you purchase."

Mr. Smith, Ionia: I would like to ask Mr. Lyon to explain about peaches reproducing from the pit.

Mr. Lyon gave a number of illustrations of varieties that reproduce very true from the pit, naming among them Hill's Chili, Crawfords by selection of seedlings by foliage, Barnard, and Red Cheek Melocoton. In growing trees as seedlings oftentimes the only change that will be perceptible will be a change in the time of ripening. The reason for one variety coming true while others do not may not be known, but the facts concerning them are very well understood.

Mr. Baldwin did not believe in the idea brought out in the last few sentences of the essay, that the Wager budded on another stock will not reproduce from the pit once in fifty times.

Mr. Green, Eaton Rapids: We have for a long series of years grown the Melocoton from pits without any material change in the characteristics of the stock.

The next paper was by A. S. Partridge, of Flushing, entitled

STONE FRUITS FOR GENESEE COUNTY.

To me is assigned the difficult though pleasant task of considering the culture of stone fruits in Genesee county. I accept this task first, for the benefit that will accrue to me from a research of the classes and varieties of these fruits that form so important a branch of our horticultural interest in the State and county; and secondly, that perchance I may create, or help develop, a greater interest in the culture of the same. As I look over the county I behold in every part of it the industrious husbandman, who has swept away the wilderness and made the land fruitful by his industrious and intelligent tillage of the soil. Not even will he allow the swamps and low lands to lie idle, for with a herculean energy has he grasped the shovel and spade, and by their use caused an innumerable network of artery and vein tiling that saps these lands of the surplus moisture that destroys their fertility, and makes them the most fertile lands we have for our cereal crops. Scarcely is there any land in Genesee county that may not thus be redeemed.

Another thing is noticeable in many parts of the county, and that is while the farms are yielding such abundant crops of grain, many of them are almost destitute of fruit trees of any description. Even the apple tree, which grows and bears so well in any part of our county, is not allowed a place, and in some places where it is, no care is given it.

Not one of the narrow, sandy-ribbed pine belts that stretch into the northern tier of our towns need be destitute of an ample supply of fruits for home and market, for I have observed that on some of these lands where the yield of grain is meagre, these fruit trees thrive and bear well. Well would it be if every one in our county who owns land, be it much or little, would in some degree plant and cultivate the fruits.

One thing is very much needed, and that is more honest agents and reliable nurserymen to furnish good and reliable stock to plant, and that at a lower figure. Many, if they would join our society, would come into possession of the State Horticultural Reports, and thus gain that information that would be almost invaluable to them. How can an inexperienced man out of the 239 varieties of apples, as listed by the report of 1878, make a judicious selection?

But to my subject I now invite your attention. It has long been a question with some whether we can grow stone fruits in our county or not. Lying as we do in the central northeastern portion of the State, with our timber well cleared away, our fruit trees mature their annual growth much earlier in the season than they used to.

The fruit buds are also well matured, and the texture and quality of the fruit finer as a natural result, which enhances its keeping qualities.

In the selection of these fruits we should select of the classes those varieties that stand the highest for dessert, cooking, and market use, and what we do not want for our own use, sell. We should keep well in view the hardiness and productiveness of the tree as well as the time of its fruitage. The soils have much to do with the results. Then the locality, be it fruit or ornamental trees that we plant, shows how well we appreciate this, the best material heritage that God has given us. I regard nothing in the line of stone fruits outside of cherries, peaches, plums, and prunes profitable to cultivate in this county. The amateur might try his hand at whatever he chooses.

Of the 63 varieties of cherries listed, but a very few are worthy of our culture. Ten is the highest standard as to quality and market:

	Dessert.	Market.
Bigarreau, or Yellow Spanish	10	9
Black Tartarian, a rapid grower and prolific	9	9
Burr's Seedling, big tree, bears profusely	9	8
Downer's Late—very late	9	10
Pontiac—fine late	8	8
Governor Wood, very desirable	9	8

The common red cherries are as follows:

Kentish, or Early Richmond	8	10
Kentish—late	8	9

Many of these are easily grown and I believe would pay most bountifully if we would plant a long row or two in road fence corners or across our fields, and thus an ample supply would be produced to regale the weary traveler and cheer the beautiful songsters of Heaven that are of so much value to destroy the innumerable insects that destroy so much of the products of the earth.

Of peaches I will name a few varieties with a view of hardiness and profitableness. The Barnard, a large peach, if not allowed to overbear; Crawford's early and late; Cooledge's favorite, one of the best early market peaches; Hill's Chili, a hardy tree, good bearer, and profitable variety for a cling if desired; Large White, and Tippecanoe; Smock Free, one of the latest and most profitable market peaches; Red cheeked Melocoton, the parent of the Crawford's, early and late; Richmond, a few days later than the early Crawford. We may have fine crops from seedlings. I have raised peaches from the first and second generation of seedlings of good quality and bountiful yield, and that too, annual bearing that would be hard to beat with any of the named varieties. The trees are hardy and will renew themselves for a goodly number of years.

Plums may be grown in any part of this county, and upon any of its soils. Among the varieties I consider the following the best. The highest standard for dessert, cooking, and market is 10: Green Gage, though the tree is a slow grower, stands best; dessert 10, cooking 8, market 6. Bavay's Green Gage, tree a little better grower and quite as fine as the Green Gage, ranks, dessert 9, cooking 9, market 9. Canada Egg grows and bears well, and is superior for market: ranks, dessert 7, cooking 10, market 9. Coe's Golden Drop, a beautiful, excellent plum; ranks, dessert 8, cooking 6, market 9. The Imperial Gage, productive, excellent; shoots dark and vigorous; ranks, dessert 9, cooking 9, market 9. Lombard, tree vigorous, hardy, productive; leading market variety; ranks, dessert 6, cooking 10, market 10. Washington, one of the largest and most beautiful, ranks dessert 8, cooking 10, market 7. Princess Yellow Egg, a fine market variety, ranks, dessert 8, cooking 8, market 9; an old favorite, being hardy and productive. Smith's Orleans also ranks well.

The swine and fowls should have the freedom of the plum orchard.

Prunes may be grown wherever the wild plum is found, by grafting upon its stock. They will grow vigorously, and if allowed will soon die from overproduction.

Following Mr. Partridge's essay, the president read the following paper upon

THE VINE.

ITS HISTORY.

We may easily imagine that the vine was one of "the trees of the garden, which man, in his pristine state, was required to dress and keep, and the supposition may be equally natural that its twining branches and abundant foliage may have supplied his chosen shelter, if, indeed, shelter were needful during this his earliest horticultural experience.

However this may be, sacred history informs us that one of the first acts of man, after the flood, was to plant a vineyard.

Phin, in his work on Open Air Grape Culture, chapter 1st, says: "Records of its culture are found in most of the poems and sculpture of antiquity. The shield of Achilles represented a vine-gathering, and Herodotus and Theophrastus speak of the culture of the vine in Egypt, and on the very oldest Greek tombs are found pictures representing the vine harvest. Pliny enters fully into the natural history of the vine, and describes a variety with berries shaped like the finger, while the second book of Virgil's Georgics forms no mean treatise on practical viti-culture."

Nearly 1,500 years before Christ the Israelitish spies cut, at the brook Eschol, a single cluster of grapes, which they bore away, "between two, upon a staff."

The native country of the grape, upon the Eastern continent, is a matter of great uncertainty. Inasmuch as their numerous varieties are all referable to the single species (vinifera) it seems altogether reasonable to suppose it indigenous in some definite region, and since it is found, in the wild state, in the most perfect condition in the region southward from the Caspian Sea, this is, by some, thought to be its original home.

The mythological account of the marches of Bacchus is supposed to relate to the extension of the culture of the vine from Asia into Europe, where it was generally introduced as early at least as 600 years before Christ. During the reign of the emperor Domitian, he, fearing a scarcity of grain, in consequence of the extensive planting of the grape, issued a restrictive or prohibitory edict (A. D. 81), which was continued in force a long time, through the fear that the abundance of fine wine might tempt the barbarians of the north to invade the country. After its introduction into Europe its culture soon spread throughout the region along the Mediterranean Sea. It was introduced into Southern Germany about the third century before Christ, and in the days of Charlemagne had become generally distributed throughout France. It was also introduced into England by the Romans.

The genus Vitis includes not only the European grape (vinifera), which proves to be unfitted to the climate of the eastern United States, but also the northern fox grape (Labrusca), the summer grape (Aestivalis), the winter or frost grape (cordifolia or riparia), all which are indigenous in portions of the northern United States, and the Muscadine or southern fox grape (Vulpina), which includes the Scuppernong, and which is mainly confined to the southern United States.

With the exception of vinifera, all are indigenous in the United States easterly of the Mississippi river. Farther west, in the mountain region, and especially on the Pacific Slope, the climate seems adapted to the growth of vinifera, which was introduced there by the Spanish during their occupancy of the country. For many years the labors of our would-be vineyardists were confined to efforts for the acclimatization of the European grape, in futile efforts to accomplish which large sums of money were expended. After repeating the trial again and again, attention began to turn to the Catawba and Isabella—natives—whose introduction to the public occurred about 1818 to 1820, and through them to the idea that a supply of this want might be found through the improvement of our native varieties. Little was, however, accomplished in this direction till the introduction of the Diana, Delaware, Hartford Prolific, and Concord conspired to give increased assurance of the success upon which we are now able to look back and wonder at the reluctance or tardiness which characterized its inception.

SPECIES AND HARDINESS.

Of the improved natural varieties of to-day, a few only are referable to cordifolia or riparia, of which Clinton and Janesville are examples; a few also are referred to Aestivalis, among which we name Eumelan and Cynthiana; none, if we except Scuppernong, are referable to Vulpina. A few, of which the Arnold Hybrids are examples, arise from a combination of cordifolia with vinifera. A very considerable number, of which the Rogers Hybrids are examples, result from the combination of Labrusca with vinifera. A yet more recent set of Hybrids, among which are several of those originated by Mr. Ricketts, results, ostensibly, from combinations of certain native species with each other. Among these improvements, one of the earliest introductions—the Delaware—is of unknown parantage; and botanical experts seem, even yet, to be undecided, to what species or combination of species to refer it. The great mass of our improved varieties, and among them, especially, those that stand highest in popular favor, are of purely Labrusca parentage; of these Concord and Ives are prominent examples.

The fatal objection to the cultivation of the European varieties in this country is their liability to mildew, a liability which they seem to impart to their progeny, even when produced by hybridization with our natives. So far as hardiness is concerned, the fact that cordifolia, and perhaps Labrusca, are indigenous as far north as Quebec (about lat. 47°), may be accepted as conclusive of their hardiness in Michigan, and that failure in their cultivation in our climate should probably be attributed to some cause other than temperature.

PROPAGATION—ITS OBJECT.

Nature's mode of propagation is, of course, mainly by seed, and her processes tend solely to the reproduction of the original plant; but with the least possible regard for the gratification of human preferences, so far as quality and flavor of juice and pulp are concerned. Amelioration proper, estimated from the standpoint of Pomology, is usually, if not always, secured at the expense of some other quality of either plant or fruit; often that of vigor, or even health; and it is rarely secured, except as the result of artificial treatment, continued through a lengthened period, with the result of breaking up the fixity of habit and begetting a tendency to sport into what we usually designate as varieties, when grown from the seed.

In many varieties of peaches this tendency is yet so much a fixity that they usually reproduce themselves, with the flavor, and other qualities of the fruit, nearly or quite unchanged; while with most other fruits the tendency to revert to the normal or wild state is so decided that we shall be fortunate if even one out of a thousand of our reproductions from the seed shall equal its parent in the qualities valued by the pomologist. By the great mass of fruit-growers, however, propagation from the seed, except accidentally, is rarely practiced, and hence the production of valuable varieties seldom occurs with such persons.

We scarcely need be told that the microscope reveals the fact that a seed is merely a cerement, containing, wrapped up in its protecting tissues, the incipient members of the future tree; and also that every wood bud upon a tree carries within its folds the same possibilities, with the important exception, however, that from the bud the resultant tree or branch lacks the power of the seed to sport into varieties. This fixity, in the character of bud growths, affords with many, if not most plants, the only sure and convenient means of continuing or multiplying a variety by propagation. Since, therefore, all, except botanists and professional propagators, are concerned mainly in the perpetuation of varieties, by the multiplication of plants, we will, henceforward, confine ourselves to this branch of the subject.

MODES OF PROPAGATION.

Layering

Is the most simple and ready mode of increasing a stock of plants, and, from its convenience, when only a few plants are desired, it is very generally practiced by other than regular propagators. It consists in selecting a convenient shoot of recent growth (not more than a year old), and imbedding it three to five inches deep in the soil at the base of the plant, confining it firmly, if needful by means of a hooked peg, and leaving the top above the surface.

The stronger canes of the vine usually send forth from each bud smaller shoots, called laterals. When such a cane is conveniently placed for the purpose, open a trench four or five inches deep, the length of such cane; which must be placed upon the bottom and the trench filled, with the laterals kept upright, and their tips above the surface.

In both cases the canes will emit roots, mainly near the buds; and when well rooted, the canes should be cut from the mother plant, and may be removed at the proper season for transplanting. The cane with laterals will have emitted roots from each node (joint), and may be cut into as many plants as there are rooted laterals.

Cuttings,

When taken for propagation, should be large and well ripened, and should have at least two buds each, or more, when a length of about six inches will include a greater number. They should be cut immediately below the lower bud, and about an inch above the upper one. If cut at the time of pruning in autumn (which is preferable), it will be better to at once select a warm, rich, loamy soil, that will not bake or crack, and plant at once; otherwise, pack in damp earth, in the cellar, or in the open ground, protected against hard freezing; and in spring, as soon as the soil can be prepared, stretch a line along the proposed row, and with a shovel, open a trench along one side of the line, about six or seven inches in depth on the side next the line, with the side sloping towards it at a considerable angle. Place the cuttings against this slope, about three or four inches apart, so that the upper bud will be just beneath the surface when the trench is filled. Compact the earth well about the lower bud, after which, without filling the trench, place enough finely pulverized earth against the row of cuttings, with the same slope, to cover them to a depth of about half an inch after it shall have been thoroughly compacted with a rammer, leaving the tops of the cuttings only, visible. The rows should run east and west, with the slope facing the sun. The row should be left in this condition till the approach of the growing season, when the trench, on the side next the cuttings, should receive a liberal dressing of composted or fine manure, and be left thus till the trench shall be filled and leveled by the cultivator and hoe when first passed over it. It should, however, be filled sooner in case of threatened drought.

The advantages of the above process consist in the increased warmth received through the slight covering facing the sun, during the warmest part of the day early in the season; and the stronger growth resulting from the application of manure within easy reach of the roots.

Mallet Cuttings,

Are made by leaving a short section of the older wood attached to the base of the cutting; or, in the case of strong laterals, by using them with a portion of the cane attached. Otherwise, their treatment does not differ from that of ordinary cuttings. Little advantage can, however, be derived from their use, except that the greater size of the mallet increases the probability of success, especially in the case of light cuttings, which, otherwise, would have less material held in store to supply the demands of preliminary growth. If only such are used, however, all except the base of each shoot or lateral must be rejected, thus entailing waste of wood.

Single Buds.

Where wood is scarce, or the variety rare or valuable, and often also with more common varieties when propagated extensively, single buds are employed. In such case only a short section of wood is taken, containing a bud. This is usually placed horizontally, with the bud upward, in clean, sharp sand, with which it is covered about half an inch. The sand is kept moist, and the temperature down to about 40° or 50°, for several weeks, to encourage the growth of roots, which are produced more slowly, and at a lower temperature than leaves. Afterward the temperature is gradually raised, always, as far as practicable, keeping the sand several degrees warmer than the air above it. When the plants have made two or three inches growth, they must be "potted off" into larger pots, with rich earth, which process must be repeated two or three times during the summer; or, otherwise, bed the plants in a cold frame or a sheltered place, and gradually harden them till they become able to bear a free exposure.

Many other particulars are essential to the highest success; but the processes demand considerable experience, as well as bottom heat and other facilities only available to the more extensive propagator. We therefore content ourselves with this very general description, and pass to the consideration of

THE PROPER SOIL AND ASPECT FOR A VINEYARD.

The vine luxuriates in a warm, rich soil. It will, however, adapt itself to almost any soil suitable for wheat, corn, and general farm crops. It should, however, be remembered that a vineyard is a permanent plantation, and that, on a retentive soil, a season is occasionally liable to occur so unusually and constantly wet as to inflict upon the plants irreparable injury, or, on the other hand, a severe drought may so parch them as to ruin a crop of fruit if no worse.

It is needless, on the other hand, to advise against the selection of very light, poor, or excessively porous soils.

The alternative, therefore, is a loamy soil, whether clayey or sandy, with a subsoil either naturally pervious or thoroughly underdrained.

In the climate of Michigan, the aspect should be either level, southerly, or southeasterly, never westerly or northerly,—even in the mild climate of Italy a western exposure is considered inadmissible,—and the plantation should, by its slope, or by other effective means, be sheltered from the influence of cold, northerly, or westerly winds.

PLANTING.

European vineyardists often plant their vines as close as three feet; and our earlier American planters, borrowing their ideas from this source, failed to consider the difference in the natural vigor of the two classes, and commenced a similar practice, which is not even yet wholly abandoned; although there is and has been a growing tendency to attribute the rotting of the fruit, and perhaps other unfavorable particulars, to the excessive pruning requisite to keep them within such prescribed limit. Be this as it may, it can have little to do with the earlier pruning of the plants; hence we omit farther remark on this point till a subsequent branch of the subject shall require its farther consideration.

Assuming that the planter will have already learned the A. B. C. of horticulture,—the necessity of the thorough fertilization and preparation of the soil,—and that he knows how and when to plant well and successfully, and moreover, that he understands what constitutes a suitable plant for his purpose, we pass to the subject of

PRUNING.

First Year.

We would advise, by preference, the use of plants of one season's growth—certainly not older than two years; and, without regard to their relative vigor, all should, when planted, be cut back to one shoot, and that shoot to two or three good buds.

In the early summer these buds will probably each send forth a shoot. After they shall have formed from two to four leaves each, select the strongest one—the lower by preference, and cut away, rub off, or pinch off the tip of the other, and thus direct the full vigor of the plant to the formation of a single strong shoot or cane; which should be tied upright to a temporary stake, instead of being left to trail upon the ground, by which means its vigor will be considerably increased.

As its growth progresses it will push forth laterals, the growth of which must, of course, be so much in diminution of the vigor of the primary shoot. These laterals, therefore, must be stopped above the first leaf by pinching off their tips; if their growth is renewed, stop them again after forming another leaf, continuing so to do. To cut them wholly away would usually force a new growth from a bud at the base of the lateral.

We have now brought the plant to the close of its first season's growth in the vineyard, and from these directions we deduce three rules, of universal application:

First, The upright position of a growing cane is most favorable to its vigorous growth;

Second, A cane intended to fill a future place, whether upon stake or trellis, must not be permitted to expend its vigor in the production of laterals;

Third, The cutting away of a lateral will usually start the bud at its base; and since, upon vines of bearing age, this is usually the fruit bud for the ensuing year, the coming season's fruit will thereby be lost.

In a climate like that of most parts of Michigan where winter protection is desirable, if not even necessary, it becomes essential that pruning be done before the vines receive their winter covering, and when the young wood is to be used for propagation, it should be cut soon after the dropping of the foliage and before the occurrence of severe frosts.

Even in the absence of these considerations, since to avoid bleeding, the pruning must be done a considerable period before the commencement of growth in spring, and the weather is usually uncomfortable for such purpose at that time; the autumn will usually be found preferable.

Rubbing off superfluous buds, and the stopping of laterals, must, of course, be done during the season of growth; these, however, can hardly be considered as pruning.

In view of the above considerations, we recommend that the needful pruning, preparatory to the next season's growth, be done during the month of November.

Acting accordingly, we close the operations of the first season in the vineyard, by cutting the growth of the season back to three buds.

Second Year.

After the second year's growth is well started, examine the plants, select the strongest two buds left at the fall pruning, and pinch back the remaining one. Tie the two canes to the stake, and pinch back all laterals, as directed last year.

At the annual pruning in November, if the vines are to be trained to stakes, all those whose two canes have made growths of eight feet or more, may be cut back—the stronger one to be about half its length, and the other to two or three buds.

In case of a vine of less vigorous growth, it will be preferable to cut one of the canes wholly away, and cut the other back to two or three eyes, and repeat the last year's treatment.

Third Year—Training to a Stake.

The third spring, if not before, each plant must be provided with a strong stake from five to six feet in height above the ground. The longer cane must be tied to the stake, as a fruiting cane. This is sometimes bent in a curve, and tied to the stake in this form, for the purpose of increasing its fruitfulness.

From the eyes left at the base of the other cane when cut away, a new cane must be grown in the manner heretofore described.

In November the cane that has already fruited must be cut back to near its base, and the alternate cane, the growth of the current year, shortened, as heretofore specified, to half its length.

Fourth Year—Training to a Stake.

With the opening of spring the new cane must take the place of the old one cut away, while another is being grown from the alternate spur.

This renewal process is to be continued indefinitely; or till, by the annual lengthening of the spurs from which the canes are grown, they become inconveniently elongated, when they may be cut back nearly to the original base, and new canes produced from dormant buds.

On good, rich soil, with sufficient space between plants, two stakes may be set; one on each side of the plant; and two fruiting canes grown, with an alternate for each.

TRELLIS.

How Constructed.

A trellis is generally preferred by experienced and successful vineyardists. The management of the vine upon a trellis when conducted upon a thorough system, brings the fruiting process so completely under control that with care and experience, the fruit may be properly distributed over the plant, and superiority of cluster, and the highest quality of fruit secured.

The trellis should be in place at the commencement of the third year, if not earlier. It is best made of number ten or twelve wire, although strips of timber answer perfectly, except for the frequent necessity of repair. Three wires (or strips) are usually employed; the lowest from fourteen to eighteen inches above the surface, and the two others a similar distance apart, making the trellis about four and a half feet in height. We prefer a fourth wire, especially for the more vigorous varieties; or, what may be preferable, a stout, narrow strip, the same distance above the third wire, which, if of good material and strongly nailed to each post, will serve to prevent any displacement of the posts from the sagging or shrinkage of the wires.

Andrew S. Fuller, of Brooklyn, N. Y., in the Grape Culturist, describes a trellis with upright wires which are movable sidewise to adjust them to the position of the canes, and which, for this and some other obvious reasons, offers important advantages in the management of the growing canes.

Second Year's Training to a Trellis.

Up to the close of the second season's growth the treatment should be the same as in the case of training to stakes, except that at the close of the first year, the cane should have been cut back to a bud just below the lower wire of the trellis, and if the vine be strong enough at the close of the second year, the two canes should be cut back to a little less than half the distance between the plants.

The weaker plants having received an additional cutting back (as described under the head of the second year), are to be attached to the trellis a year later.

Third Year's Training to a Trellis.

Before growth commences in the spring, the two canes left at the last fall's pruning, must be bent down to a horizontal and tied to the lower wire of the trellis, extending in opposite directions. Mr. Fuller, however, says very truly: "If the ends are fastened to the lower bar in a horizontal position at once, the buds nearest to the base will usually push first, because the short bend in the cane at that point checks the flow of sap and forces it into the buds near by, while the sap that flows past these buds goes rapidly to the extreme end of the arm and forces the buds at that point into growth. In such case the buds between those at the base and the extreme end will sometimes fail to produce canes. To avoid this we bend the canes; this graduates the check which is necessarily given to the flow of sap, and each bud stands more nearly the chance to get its proportion. When the buds have all started and made a growth of two or three inches, the arms should be brought up level and fastened to the side of the lower bar."

With long jointed canes each bud upon these horizontal arms (as they will now be called), may be allowed to produce a cane (or about six or eight, distributed as evenly as practicable along each arm), which canes, as they lengthen, must be trained vertically and tied to the trellis.

These canes must be stopped (by pinching) several times during the growing season, the stronger ones the most frequently, for the purpose of strengthening the lower buds, and equalizing the growths.

Under favorable circumstances each of these canes may be expected to set more or less fruit. It will, however, be better for the future of the vine if not more than one or two bunches upon each cane be permitted to remain.

At the pruning in the autumn of the third year, cut all these canes down to two or three eyes.

Fourth Year's Training to a Trellis.

With the commencement of the season's growth start two canes from each of the spurs left at the last fall's pruning, training them upright and evenly distributed upon the trellis, and stopping all laterals, and the leaders occasionally, as heretofore directed, for the purpose of equalizing their growths.

These canes will probably each produce three good clusters, possibly more, but the vineyardist will need to be on the alert to prevent excessive fruiting, the effect of which will be deficient quality, imperfect clusters, or failure to ripen, and, very possibly, the permanent enfeeblement of the vine.

At the fall pruning cut the upper of the two canes upon each spur wholly away, and cut the lower one back to two or three buds.

SUBSEQUENT TREATMENT.

In subsequent years repeat the process last described, keeping the spurs upright by reversing the order of cutting away the spurs each year, and keeping up the practice of occasionally stopping the canes as a means of maintaining equality of vigor, strengthening the lower, or fruiting buds, and withal, avoiding a waste of vigor in excessive wood growth, by checking a tendency to extend far above the trellis.

VINES IN THE GARDEN,

Or other sheltered place where space is limited, except in height, and where the soil is, or should be, rich, may be planted four feet apart in the row, and trained upon what may be called a double tier trellis, considerably higher than that already described, every alternate vine being trained upon the lower wire of the trellis, and limited to its lower half, and the remaining ones grown up to the center wire before arms are laid down, and the upper half of the trellis devoted to them. The training, otherwise, will be as already described.

In the above case, however, especially with the more vigorous varieties, the plants may stand eight feet apart in the row, and two canes be grown from a single root; one trained to occupy the lower half of the trellis, and the other carried up to the center wire, and the arms laid in to supply wood for the upper wires of the same.

Fuller, in his Grape Culturist (from which we have drawn largely in the foregoing), describes a

SINGLE OR OBLIQUE ARM SYSTEM,

Which, with slight modification, and (as we imagine) improvement, we have seen practiced in our State with very satisfactory results.

Under this system the vines (planted at any desired distance in the row) are grown the first year with a single upright cane, as heretofore described. At the fall pruning cut this cane back to two buds, from which, the second season, one cane (instead of two, as heretofore) is to be grown. At the fall pruning cut this back to within six or eight inches of the next vine, measuring from its base to a point on the lower wire directly over the next plant, and the third spring lay it down as a single arm, with its top elevated and tied to the lower wire of the trellis. It should be kept as nearly straight as practicable, and, if needful, a strand of trellis wire, or a wooden strip may be used for the purpose.

The growth and renewal of canes, and the equalization of their vigor by pinching, should be conducted as heretofore described.

If the growth of the single cane during the second season is not strong enough to warrant leaving it the full length (from plant to plant), it must be cut to such length as its strength shall warrant, laid down and managed as described above, except that the upright grown from its extremity must be encouraged to grow strongly during the season, cut to the requisite length in autumn, and the next spring laid down to complete the hitherto deficient arm.

The simplicity of this system is greatly in its favor, and in localities in which winter protection is needful, it affords the important advantage that when the autumn pruning has been done, only a single arm with its spurs remains, and that easily covered without the necessity of bending with the consequent danger of breakage.

FAN TRAINING

Requires for the first two or three years nearly the same treatment as for training to stakes. The one year plant is cut back, and the next year allowed to produce two canes, each of which in the fall is cut back to two or three eyes, from which two canes are grown the third year. These four canes are cut back the next fall, producing at the close of the fourth year eight canes. This process is continued till the trellis is filled with wood, which is distributed upon it in the form of a fan—whence the name. After the trellis is fully occupied the fruiting wood is cut away and renewed, in a manner akin to that heretofore described.

The vineyardists of our State, generally, so far as we have had opportunity to observe, practice a system of pruning (if system it can be called) somewhat akin to the above, but lacking mainly the processes for equalizing the vigor of the canes and developing the fruit, which are prominent features of the systems described. The process in question certainly avoids the necessity of adopting and becoming familiar with a system, but we fail to apprehend that even this haphazard process is more easily mastered than the more systematic one; while results, so far as we have observed them, are greatly in favor of the more methodical processes, several of which we have not time even to notice.

THE COMMON PROCESS

Referred to, consists in planting one, two, or even three year plants, often with several canes, all of which are cut back, generally to near the ground, and left to grow at random the first season, at the close of which the weak plants are sometimes cut back for another year's trial, while the canes of the strong ones are thinned down to two, five, or even six of the strongest canes, and these cut back to two or three feet, or (if a trellis is to be used) to the lower wire, leaving the young wood to grow pretty much at random; only encouraging it to occupy the two upper wires of the trellis.

The primary shoots having originally been mostly cut back to the lower wire of the trellis, the bearing wood springs from their tops, and at the annual pruning the judgment of the operator is relied upon to select the most profitable wood for the next season's fruiting, and to determine how much of it ought to remain for that purpose.

These canes are usually allowed to set all the fruit they will, which is, in consequence, liable to be in excess of the capacity of the plant, and to become imperfect in bunch, and even deficient in quality, on account of excess of quantity.

There seems to be no provision for the removal and replacement of old, elongated, or enfeebled spurs, but this is left to the accident of the pushing of fresh random shoots from the old wood, and to the inspiration of the pruner at the moment.

Several of the ills that afflict the grape in our country are, by many, and with apparent reason, attributed to their refusal to accept the strait-jacket imposed upon them, by inference, from European systems, for the management of the less vigorous vinifera.

Mildew is thought to be increasingly prevalent as a consequence of enfeeblement from limiting the range of the roots by too close planting, and its necessary consequent excessive pruning.

The rotting of the fruit before maturity is, also, by many supposed to result from the same cause—a supposition not without warrant, since this malady rarely, if ever, attacks the fruit of young vines. Experiments in the way of giving the vine more root and trellis room, while they can, as yet, hardly be said to have established the correctness of this supposition, have, nevertheless, gone far towards rendering it at least probable.

Evening Session.

At the opening of the evening session Prof. Beal, of the committee to whom was referred the president's message, made the following report:

We recommend, in accordance with the president's suggestions, that efforts be made to bring about a more intimate relationship between this society and those of other States and the British provinces. To secure this end, we recommend that messages be sent to other societies meeting at the same time of our own; that an effort be made to change the days of holding the annual meeting of some of those societies. We recommend that this society, through its executive board or otherwise, appoint delegates to attend the coming meetings of the American Agricultural Association, the Illinois State Horticultural

Society, the Mississippi Valley Horticultural Society, and any other meetings of State societies to be held during the winter. We recommend that the members of this meeting extend a cordial invitation to the officers of the American Pomological Society to hold their meeting in 1885 in our State. We recommend that an effort be made to secure an appropriation by the State for defraying the expenses of a suitable delegation, who shall make an exhibit of Michigan fruits at the meeting of the American Pomological Society, to be held in Philadelphia in September of the coming year. We recommend that as the highest award for exhibits, except at the State fair, we offer the report of the committee neatly engrossed. We recommend the awarding of diplomas or premiums for plans of farm houses and their surroundings, including outbuildings, drives, paths, lawns, trees, flowers, gardens, and orchards. We also make a similar recommendation with reference to plans for ornamenting the grounds of our country schools. We recognize the great value to our State of the numerous local horticultural societies, and recommend that we try to devise some means for increasing their number and making those which now exist more efficient. We approve the president's suggestion that efforts be made to establish branch societies in the Upper Peninsula. We fully recognize the great value to pomology of the untiring efforts of our president in helping to diffuse information in regard to correct nomenclature. Also his efforts in making a fine catalogue for the different localities in our State. We are much gratified with the earnest and successful efforts of our secretary in establishing branch societies, and in doing so much to improve our exhibits of fruit. We are thankful that we have a secretary who makes a report second in value to none in our country. We also feel gratified that he so loves this work in his own native State, that he has refused to abandon it, although frequently tempted to do so by very much larger salaries than we have been able to give. We recommend that a meeting consisting of one delegate from each of the local horticultural societies of the State be called to meet in Lansing the 2d of January, 1883, to see what means can be devised for securing aid from the State to more fully compensate some officer of our society to enable him to devote a larger portion of his time in advancing the interests of horticulture, and in disseminating useful information of this character among the people of Michigan.

Respectfully submitted,

W. J. BEAL,
A. S. PARTRIDGE,
N. A. BEECHER.

A considerable discussion upon the report was indulged in, all commendatory however. Every man that spoke desired that the provisions of the report should be carried out, and on motion of Mr. Baldwin the report was referred to the Executive Board with the request that ways and means be adopted, if possible, for carrying out its suggestions.

The convention next listened to a paper read by I. H. Butterfield of Port Huron, on the subject of

TARIFF LAWS CONCERNING HORTICULTURAL PRODUCTS.

A mere statement of the rate of duties, which is the substance of the laws relating to the importation of such products, could be given in a small space. The law simply says: "There shall be levied and collected on certain articles duties—specific or advalorem, as the case may be—to the amount of a certain percentage of the value." In discussing the principles relating to the tariff question, the rate of duty is not the sole question yet it is of course the most important one, and to decide the point at which the duties levied, sufficiently protects American industry and after that is an unnecessary burden, requires close discrimination and sound judgment.

Those who are engaged in horticulture are usually intelligent, wide-awake people, and are perhaps better posted in public affairs than is the average farmer; and the very general discussion of the tariff question has of late been so full and complete that nearly every one has his position clearly defined in his own mind. And yet except in one or two specialties has the farmer or horticulturalist any intimate knowledge concerning the duties which certain products in which he is interested pay, and does not really know whether they be to him a burden or a protection. He has been content to adopt as the correct system "a tariff for revenue," "a tariff for protection," or "free trade," as the case may be, on general principles, and has paid but little attention to the rate, perhaps does not know what it is on any of these products.

I do not propose to enter into any extended discussion of the principles underlying the policy of the government relating to the tariff. It is, however, generally conceded that the present laws need revising to suit existing conditions of trade and commerce, and the tariff commission which has been for some months engaged in this work will, without doubt, present a plan for a better adjustment, by which burdens may be removed or equalized.

I propose now to give you some facts relating to the present tariff, such as rates of duty on horticultural and agricultural products, and articles directly connected with agriculture and horticulture; also the amount and value of the present importations of the principal horticultural and some other products, and the amount and value of the main articles of export. I have also communications from two of the largest dealers and seedsmen in the country, with a short statement of their views on this question, and possibly from this may draw some conclusions as to the position which it is for the interest of the horticulturist to maintain on this question; and I may state here that what I say on this point will be in favor of protection, true and impartial I hope, but trust also correct.

RATES.

The rate on all fruits of the varieties grown in Michigan, green, ripe, or dried, is 10 per cent ad volorem, including also the value of the packages containing them. The same class of fruits preserved in their own juice, or hermetically sealed in cans, jars, or bottles, pay 25 per cent. Fruits of all kinds, preserved in sugar, 35 per cent. Oranges and lemons, 20 per cent. Other tropical fruits, 10 per cent. Dried plums or prunes of commerce, 2½ cents per pound. Fruit oils, or essences of all kinds, $2.50 per pound. Oil of peppermint, 50 per cent. All plants, trees, or cions pay 20 per cent, except tropical, and semi-tropical for propagation, which are free. Bulbs and bulbous roots, 30 per cent. Seeds of all kinds, garden, field, and flower, pay 20 per cent. Forest tree seeds, free. Sugar-cane, sorghum, and sugar-beet seed, free. Nearly all crude vegetables 10 per cent. All dessicated 35 per cent. Potatoes, 15 cents per bushel. The above includes nearly all the horticultural products imported, and in which we are interested. In a few instances the rate varies from that above given, but only in a few cases, and they are of no importance in this connection. It may be interesting to some to hear quoted the rates on some products more distinctly agricultural.

All grain for seed pays 20 per cent. Oats, 10 cents per bushel. Barley, 15 cents per bushel. Wheat 20 cents per bushel. Peas and beans for consumption, 10 per cent. Hay pays 10 per cent. Live stock of all kinds 20 per cent. Improved stock, imported for breeding purposes, free, under proper certificate. All farm implements and machinery of wood and iron, 35 per cent. Where steel is chief value, 45 per cent. Wools, merino or down clothing wools, unwashed and unscoured, and whose value is 32 cents or less per pound, 11 cents per pound, and 10 per cent; of greater value 12 cents per pound and 10 per cent; combing wools, such as Cotswold, Leicester, etc., in the same condition and of the same value, pay the same rate. Carpet wools of low grade, such as we do not produce, value 12 cents or less per pound, 3 cents per pound; of greater value, 6 cents per pound.

Imports and *Exports*. The imports of flax seed, which, however, is not used for seed, but for extracting oil, and is decreasing in quantity each year on account of the increased product here, is $1,250,580 in value; all other seeds paying duty, $462,526 value. Of grains, barley 9,528,616 bushels; oats 64,412 bushels; rye 473,925 bushels; wheat 200,000 bushels; peas, beans, and other leguminous products, 365,656 bushels; flax straw 5,000 tons, while at the same time thousands of tons are wasted in the west for want of facilities to use it. Potatoes in 1881, 2,170,000 bushels. The present year they will not be one-fourth that.

Imports: Wool, 55,964,236 pounds. The domestic product is 240,000,000 pounds. Exported, paradoxical as it may seem, 5,578,989 pounds. Imports of carpets, 1872, 5,072,247 square yards. In 1882, 991,947 square yards, notwithstanding the great increase in the quantity used.

Live stock imported other than breeding stock is not large, and is mostly from Canada. Imports of breeding stock are now heavy, and have vastly increased, particularly in cattle, sheep, and horses from Great Britain; horses from France and cattle from Holland.

Our exports for the year ending June 30, 1882, were: apples, dried, $1,247,891; green or ripe, $2,301,334. Total apple product exported, $3,549,225, not including that in cans or preserves. Other fruit exported, $361,217. Preserved fruit, $529,277.

Exports of oil cake, $6,284,364. Cotton seed, $147,543. We are sending too much of this excellent food to other countries. To retain and feed it would add to our meat product, and we lose also the manure product, which feeding it would greatly increase. Clover, timothy, garden, and all other seeds exported, $915,223, so that, not including flax, our exports are more than our imports. Through the courtesy of Prof. Tracy I have a letter from the firm of D. M. Ferry & Co., the largest seed dealers in the world, and also have a note from Mr. Peter Henderson, a prominent vegetable gardener, florist, and seed dealer in New York. Prof. Tracy writes:

"In reply to yours, we would say that there are certain seeds, notably cabbage, which give a much greater yield abroad than with us, so that from this cause combined with cheap labor, they can be afforded there at much lower rates than they can be grown for here. In the case of some varieties of cabbage and turnips the foreign seed is inferior in quality to that of American growth, so much so that in the trade they are quoted at different prices, and the foreign seed is never used,—or at least we do not use it,—largely except in case of a failure of the American crop, and then with the understanding that it is not American grown. In the case of some other seeds, notably radish and cauliflower, the foreign grown seed is usually far superior to American grown, and is depended on almost entirely. As there is at present 20 per cent duty on seeds we do not use foreign seed, except in such cases as above where the advantage in the quality and price is more than sufficient to balance.

As a rough estimate we should say that including those seeds which cannot be obtained at all in this country, our importations amount to less than one-third of our entire stock. Of this, less than one-tenth comes from Canada; peas being about the only crop we get from there. Among those imported largely are beet, broccoli, cabbage, early carrots, cauliflower, celery, cress, egg plant, endive, leek, mustard, parsley, radish, spinach, Swede turnip. Our views in regard to the tariff can perhaps be best understood from the position we took before the tariff commission, and may be summed up in a few words: 'Better let it alone as it is.'

"Many experiments in seed growing are now being tried in different parts of the country, and in many cases with gratifying prospects of success, so that it seems quite probable that within a few years localities can be found where all of these seeds which we are now obliged to import can be grown to advantage, and of superior quality, in this country, and the present tariff seems fitted to foster and encourage these experiments, while it is not sufficiently burdensome to impair the business."

Peter Henderson says: "There is much to be said on both sides of the tariff question relative to horticultural products. The seedsmen here in the east had it pretty well discussed a few weeks ago when the tariff commission sat in New York, and, with the exception of two of the Philadelphia seedsmen, came to the conclusion that we had better leave it as it is, as we feared to tinker with it, well knowing that when these matters are disturbed great inconvenience is felt. Personally, I am strongly in favor of free trade in all things, believing that in the market of the world, trade would soon right itself."

I will here read from the report of the Department of Agriculture for 1878, on page 572, from an article on "Localities Best Suited to Maturing Seed," as being appropriate and perhaps interesting in this connection.*

The wool-growers are about the only producers from the soil who have taken an active part in determining legislation in regard to their interests. These are so manifestly improved by protection that there is but one stand for them to take as a class. The effect of the tariff on other products is not always so plain, particularly on horticultural products, and undoubtedly in some instances is no protection, neither a burden, but simply a source of revenue to the government.

Take the case of some vegetables and fruits imported from Canada. The markets of the United States control the price, and the duties levied are so much obtained by our government from the producers of Canada, and do not add at all to the price for the consumer.

If last year there had been no duty on potatoes, it would not, in my opinion, have reduced the price in our own markets, at least not near to the extent of the fifteen cents of duty. Of course, in taking this view of the case, we must conclude the tariff on such products does not protect the grower here, nor do I believe it does directly. The politician who quotes the rate of duty on wheat, or oats, or barley, or vegetable products, as so much protection to the farmer is simply talking like a demagogue.

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* This article, referred to, is by Peter Henderson, entitled "Localities Best Suited for Maturing Seed," is an admirable exposition of the subject, full of practical information for the horticulturist.—SEC.

The protection the grower of these products receives must come from some other source. It must be that which increases the demand for them near home. If protection helps to build up manufacturers, to increase the population of our cities, and bring to our doors, or with short transportation, consumers for our horticultural products, it is what we want. It is that which makes a market for all that we can raise, and at good prices, that will best protect us; and if we do aid our brother producers, the wool growers, by paying more for our woolens, and growers or manufacturers of other materials which we use, if we can be assured that by doing this we are helping ourselves, it is certainly for our interest to do so, and there is no need to ask the removal of duties on strictly horticultural products when we are receiving the general benefits which are supposed to arise from a protective tariff. If the money you pay is kept at home and returns again from the mill operative, or the laborer, in exchange for your fruits, it is what you want.

The producer, whether he raise vegetables, fruits, flowers, grain, meat, or wool, wants consumers, and for horticultural products especially, wants them near him.

If protection does this, it is what he wants. If not, then he does not want it. For one, I believe it does this.

But, taking things as they are under the present policy of this country, with reference to the tariff, the horticulturist has no occasion to ask for free trade on products in which he is directly interested, and ask some other class to take the charges from himself. In fact, if such should be the case, I can see very little relief from present prices. Suppose the duty of 20 per cent on seeds were taken off, can you believe that the price of the present five cent paper of seeds would be less? If as Messrs. Ferry & Co. intimate the duty on seeds has a tendency to induce experiments in seed growing in various localities till we shall produce all our seeds; Who will say that it is not better for us? And if true of seeds, why not of trees and plants?

I have said so much on the tariff and in favor of protection because your secretary intimated that the matter was being discussed among members of this society, and officially by other societies. Let the horticulturists give this matter due consideration, and act for the best interests of themselves and the country.

Following Mr. Butterfield's paper, was an address by Prof. W. J. Beal, of the Agricultural College, thoroughly illustrated by numerous charts and drawings upon

THE STRUCTURE AND GROWTH OF A TREE.

A few days ago the hazels, beeches, chestnuts, oaks, hickories, walnuts, and buckeyes, matured their fruit, and with this maturing the burrs, or cups, or husks, opened or the stems snapped in two at a joint which began to form months before. There was a weak spot in the flower stem. To make up for this weakness, the place was swollen or enlarged. If a burr or nut held fast too tenaciously, the frost made it willing to drop, and down it went with hundreds of others, among the leaves.

The leaves, with the help of the shifting winds, gently covered the fruit—or some portions of it. The leaves make the best kind of protection from dry air and severe cold; and they come just in the nick of time. To be sure, all the seeds and fruits are not covered, but Dame Nature is generous. She produces an abundance; enough for seed and enough to feed the birds, squirrels, and other animals. If a hundredth part of the walnuts and acorns and hickory nuts of a single good crop were to germinate and become trees, they would crowd each other and most of them perish for want of light, room, and nourishment.

The squirrels eat many, but carry a portion to some distance in every direction, where they plant one or two in a place. It may be the thought of the squirrel—I cannot read all his thoughts—to return at some future time of need, but his bump of locality is not well developed or he has laid up more than he needed. At all events some of the nuts are allowed to remain where he planted them. In this way, he is a benefit to the trees and pays for the nuts which he eats. He has not lived in vain for he is a tree planter and believes in arboriculture. His arbor days come in autumn, and he needs no gubernatorial message to stimulate him to work.

Many of our trees and shrubs produce a fleshy fruit or berry. Among them are the mountain ash, service berry, hawthorn, cherry, holly, viburnum, pepperidge, hackberry, mulberry, sassafras, wild plum, wild crab apple, persimmon, paw paw, cedars, and junipers.

Many of these fruits when ripe are rendered conspicuous by brilliant colors. The fruits are eagerly sought by grouse, turkeys, deer, bear, or other animals. In most cases the seeds are protected by a very firm covering and are not digestible. They are sown broadcast by wild animals under circumstances most favorable for germination. The birds, too, belong to the society of tree planters. Deer and bear are rapidly retiring from the frontier, and happy will it be if the pioneer who succeeds them is also a good tree planter.

Other trees produce dry seeds or seed-pods, and usually drop only a portion in autumn. They hold on to a portion with considerable tenacity. Among these are the buttonwood, basswood, ironwood, blue beech, box-elder, hop-tree, tulip tree, the ashes, catalpa, locust, Judas tree, birches, alders, larches, pines, and spruces. The fruit or the seed is thin, or provided with wings, which distribute the seeds as they fall, or after they have fallen.

An ex-president of our State Agricultural Society, an off-ox, tried to convince me that these wings on the seeds or fruit were a failure and did not amount to much. He took some seeds of the tulip tree to the top of a house in a high wind and let them go. They only drifted a few feet out of the perpendicular direction. Had he looked farther and thoroughly investigated the subject he would have seen that some of these seeds are tumbled along with the dry leaves on the ground. Every once in a while a seed finds a secure lodgment in a hollow, while others go on. In winter we often have a crust on the snow stout enough to bear up these dry seeds and fruits. At such times some of them are torn from the trees by the wind, and may be seen sliding along like miniature ice-boats. I have seen them a fourth of a mile from the nearest tree and still they were moving onward.

The seed-like fruits of elms fall early in spring. The wings around the margin are not long, but the fruit readily finds its way for ten rods or more over plowed ground, even where the force of the wind is checked by young trees. I scarcely need mention the fact that the seeds of poplars and willows are often carried for long distances by the wind.

Having seen how the ripened seeds of trees are distributed, and some of them planted by the wind, by birds, squirrels, and other animals, let us proceed to examine some of these more closely to learn their structure and mode of growth. There are some things peculiar and of especial interest in each kind of tree.

Let us look at an acorn. It is surrounded by at least two coverings, a firm, glossy coat, lined by one thinner and more delicate. On one end is a scar where it was attached to the cup; at the other is a blunt and abrupt point.

On opening the coverings we find usually one, sometimes two embryos. The embryo mainly consists of two hemispheres placed with the flat sides next to each other, much as is the case with peas or beans. At the pointed end, and sunken within it, is a round point called the radicle. This is destined to produce from the tip a root, or descending axis. Opposite this radicle, and between the hemispheres of the seed is a small bud, the plumule, which is destined to push upward and become the ascending axis, bearing the branches, leaves, flowers, and fruit.

The seeds of most trees and other plants remain dormant during autumn and winter, but if the circumstances are favorable, the acorn of a white oak is more enterprising. With moisture on the ground it begins to swell, and cracks open at the pointed end. The ends of the hemispheres, called cotyledons or seed leaves, each pushes out a short stem, carrying with it the radicle and plumule. The acorn does not send up at once, in autumn, a green stem and leaves to perish in winter, but is more discreet. It sends a tap root with branches several inches into the ground and perfects a stout terminal bud, then securely waits for the rains and warm sunshine of spring.

How different the early growth of a pumpkin or bean or morning glory. They send out a few fine roots and at once put forth their leaves and branches. There is no need of careful preparation for hardships. True to its nature, the sturdy oak begins at the root of the matter to lay a good foundation. The mother tree, before casting off her progeny into the world, did not fail to give it a little out-fit in the form of starch for food stored up in the thick seed leaves. As the young chicks feed upon the yolk of the egg, so the young oak subsists on the starch stored up in the cotyledons. The starch to the plant takes the place of milk to the colt, calf, or pig.

To fully understand how the young plant grows, or the older plant either, requires a better knowledge of chemistry than I can presume is possessed by the majority of my hearers.

The starch is insoluble in water and cannot be used till it is transformed into a nearly related substance which is soluble. Air, heat, and moisture, are required to start the young acorn. To change this starch into available plant food and convey it to the proper place where it is needed, and leave it in the right shape and condition to develop the plant, requires some loss or use of force.

As the water ram needs some water to move it to enable it to send some of the water higher, so the young oak throws away, if we may use the expression, some of its substance to enable it to elevate the remainder into roots and terminal bud.

Those who are so inclined, and have some knowledge of chemistry, can notice some of the chemistry of growth as presented on this chart.

The trees of Michigan all produce seeds which have two or more cotyledons or seed leaves.

The acorn possesses a little plant in its simplest form. As Professor Tracy puts it: "A seed is a young plant packed ready for transportation." This little plant has no roots, but it has a stem, a terminal bud, and leaves. This is an oak which becomes more and more complex as it grows older.

A plant is composed of roots, stems, and leaves, in some form or other. Of these three, roots are the simplest in structure.

All parts of plants are composed of small cells. Under a compound microscope, a cross-section of a root would show the cells as small circles or polygons. Some of the outer cells make an epidermis. Very early in its development, some of the inner cells become long with tapering extremities. The walls of the long cells become thick and help give strength and solidity to the wood. Roots which live for more than one year enlarge by annual layers, in the manner to be described under the structure of stems. At the extremity of a root is the root-cap, back of which only a very little way is the primary meristem, or the place where cells are multiplied to increase the length of the root. Perhaps the twentieth of an inch back from the tip is this growing spot. Roots elongate, then, only by a growth very near the tip or extremity. Cut off this root-tip and it can never grow longer. Almost any portion of a plant may produce roots. The very end of a root is somewhat firm and is composed of cells older than than those back from the extremity.

I come now to one of the most interesting and wonderful things in connection with young roots.

THE MOTION OF ROOTS.

It has long been known that many parts of plants possessed the power of spontaneous motion to a greater or less extent. The late Charles Darwin made some very interesting experiments on this subject. During the past two years I have also made a great many experiments on this subject.

Roots, stems, and leaves bend to all points of the compass successively with a sort of rolling motion, which Darwin calls circumnutation—a bowing around. Roots grown in damp air in the dark will often make a complete coil, and sometimes two or three of them. If a piece of gummed paper be placed on one side of the root tip it becomes unusually excited and begins to coil away from the paper, sometimes tying itself into a knot, and often succeeds in rubbing off the paper.

The root generally turns downwards, no matter in what direction it first protrudes from the seed. This is not always true, however, in all of the details. In sprouting 400 or more kernels of Indian corn, in damp air, I found the direction taken by the root to vary.

During the past summer I tested some 700 kernels of Indian corn in loose soil; some in the cellar, some in the garden. In damp air roots frequently came to the surface of the soil, where they apparently grew just as well as they grew below the surface. In the garden, exposed to the sun, it is not unusual for roots of corn and beans to come to the surface and perish.

I planted some Lima beans with the eye edge uppermost. Many of them came up after a fashion, but they were a good deal confused. They bent around in various directions, and were very interesting to study.

In the garden nine out of twenty-five, over one-third, of the Lima beans planted with the eye uppermost, sent the radical with all the roots out of the ground, when the whole bean perished.

Darwin made a large number of experiments on a great variety of seedling plants, including some trees, and all, without exception, showed motion of the roots, stems, and leaves. He placed a young root under a compound microscope, where he could see it move. He sprouted some beans and placed the tips of the roots against a smoked glass to see what kind of tracks they would make. The tips, in their downward course, had alternately pressed with greater or less force on the plates, and had sometimes nearly left them.

As soon as the tip of the radicle protrudes from the seed-coats, it begins to circumnutate, and the whole growing part continues to do so, probably as long as growth continues. When the earth closely surrounds the roots they *may, perhaps*, be quite prevented from circumnutating. The tendency to circumnutate must aid in finding the places of least resistance in the soil. Geotropism does not give a root force sufficient to penetrate the ground, but merely tells it which course to pursue. The strength of the radicle of a bean is not enough to indentate the thinnest tin foil, when placed horizontally with the radicle thrust perpendicularly downwards. The radicle in such cases turns to one side and glides over the tin-foil without making any impression. The growing part does not act like a nail driven into a board, but more like a wedge of wood driven slowly into a crevice.

I spoke of the firm root-tip and the spot just back of it where the cells multiplied to extend the root in length. If this root-cap be killed with nitrate of silver, not killing the spot where the cells multiply, the root ceases to act as before, but wanders about in every direction, up, and off, and down, apparently without any object in view. It acts wild or crazy. In three or four days a new cap is produced, when geotropism again acts on them as before. Darwin says, "abundant evidence has been given, showing that with various plants the tip of the radicle (root) is alone sensitive to geotropism, and that when thus excited it causes the adjoining parts to bend."

"There is no structure in plants more wonderful, as far as its functions are concerned, than the tip of the radicle. The course pursued by the radicle in penetrating the ground must be determined by the tip, hence it has acquired such diverse kinds of sensitiveness. It is hardly an exaggeration to say that the tip of the radicle (root) thus endowed, and having the power of directing the movements of the adjoining parts, acts like the brain of one of the lower animals, the brain being seated within the anterior end of the body, receiving impressions from the sense organs, and directing the several movements."

The old name of the root-cap was *spongiole.* It was formerly thought that this was the most active part in absorbing nourishment for sustaining the growth of the plant. Abundant evidence has since been produced to show that the tips of roots do not absorb much, if any, nourishment. They do not "sponge" a living in any sense of the word.

A little way back from the tip, along the sides of the young rootlets, the cell walls are thinner and actively absorb water with what it holds in solution. In case of our deciduous trees the young roots produce an immense multitude of root hairs, *trichomes,* resembling mould or spider webs. These hairs vary in length and somewhat in shape, especially where they crowd between the particles of soil. This is here illustrated. These root hairs, so far as I know, or have ever seen, each consists of an elongation of one of the outer cells of the young plant. The root hairs vastly increase the surface of the roots, and bring the plant into the closest relation to the soil. In warm weather, when the plant is growing rapidly, the root hairs live only for a few days. They rapidly perish, and their places are supplied by others. Root hairs are not produced except on young rootlets of the same season.

I have examined and watched carefully at different times the young stems of several kinds of vines. A hop vine or grape vine twines or climbs to the top of a straight stake or support. It reaches up some higher, perhaps two or three feet; when it becomes no longer stout enough to remain in this position it falls and takes a horizontal position, at right angles to the stake.

It then begins a twisting or rolling motion the cause of which is quite difficult to explain.

In the warm part of a warm day this young vine may make a complete revolution in three hours. The tip of a vine in this way often travels ten or fifteen feet in three hours. We can readily see that this peculiarity of vines is of great use, enabling them to find any object within reach. After striking an object it no longer "swings around the circle," but clings to the new support. Time will not permit me to dwell on this interesting part of the subject. It has been found that the stems of trees which soon have stout trunks—plants which never climb—all have this swinging motion, this circumnutation. A young stem of corn, or geranium, or ash, in suitable soil, swings or alternately bends in all directions so as to make a slightly funnel-shaped hole in the ground, Of what use this can be to the plant, I cannot possibly see, but it very likely may some day be found out. It shows a close similarity or brotherhood in the behavior of plants.

As before mentioned, leaves possess the power of movement; some of them move quite suddenly when brushed or jarred, others slowly with a change of light, heat, or moisture. Young leaves, even in air which is perfectly still, are all the time changing their positions. The power of motion in young roots, stems, leaves, is universal so far as we know.

Let us return to the germinating acorn of the white oak as left in autumn. In spring it resumes its work. The stout, terminal bud gradually unfolds and casts off its scales which have served their purpose and are no longer needed. Leaf after leaf appears as the young and tender stem elongates. There is only one leaf at each joint or node of the stem, and these are arranged in a spiral. The root resumes its growth, puts out numerous new branches, and the rootlets are covered with root hairs. At the close of the first year we shall find that the stem has become firm and hard, and just above each leaf has been developed a bud.

On the branches of elms and basswoods the buds are alternate and two-ranked, *i. e.*, they are on only two sides of a branch, or point in only two directions. On the box elder, maple, dogwood, and the ashes, the buds are opposite and four-ranked, or point in four directions. While young and growing, bud scales are usually green, but during winter or at an earlier period most or all of them change to a gray or brown color. Buds vary somewhat in shape, color, and size in the same species, but the buds of one kind of tree are unlike those of other trees in some respects. There is a marked specific difference between the shape, size, and structure of the buds of our several species of poplars, so that an expert can distinguish one kind from the other by the buds and the leaf scars near them. The same is true of the buds and leaf scars of our black walnut and butternut. The bud scales are arranged with reference to each other in the same manner as the leaves on the stem. In fact, bud scales are nothing but leaves developed in a special way for a definite purpose.

Buds are often coated with wax or gum to keep the moisture from penetrating them. They are well covered on the inside with long fine hairs of wool which serve to prevent sudden changes of weather from injuring the tender leaves within, which are also often snugly packed in cotton wool.

In different sorts of trees the young leaves are often folded in different ways; in each species they are generally all folded alike. A well developed bud contains all the leaves and all the parts of the stem in a rudimentary state ready for unfolding when growth begins. By the degree of advancement, or the preparation made during the previous year for growth, we may foretell whether a tree will start and complete its annual growth early or late in the summer.

Let us look at some young branches of a white oak tree. At this time of year some of the dead leaves still remain attached where they grew. The strongest buds are towards the extremity of a branch. Near the end are three, four or five quite near each other. By looking back at the growth of 1881, we see old leaf scars. In some cases the buds developed this year into branches; in other cases the old bud still remains as a bud or has fallen off. During 1882, three or five buds near the end of a branch developed, making something like a whorl of branches. Where the bud scales fell off they left scars which somewhat resemble the wrinkles of a cows horn. The growths made during different years, when all seen at one time, not only differ in size, but the bark differs in color and some of its markings. It is quite easy by these signs to tell the age of a branch. In many cases, especially where branches are of slow growth as where they are much shaded by others above them, it is possible to count the growth made each year back for twenty or thirty years or more.

We have seen that all the branches alike consist of nodes or joints where we find one or more leaves with one or more buds just above each. These nodes are a little way apart on the stem, and the space intervening between any two contiguous nodes is called an internode. By watching the development of a young tree we shall see that it is composed entirely of nodes and internodes. An internode with the node at its apex, bearing one or more leaves, in the axile of which is one or more buds, is called a phytomer. It is here illustrated. We saw that the first or lower phytomer of the seedling developed roots at the lower extremity. The place where the seed leaves come up is the first node of the plant.

It is not unusual for any part of some stems to put forth roots. This is seen in Indian corn, poison ivy, and in some other plants. In one sense, a tree is a very monotonous affair, being made up of a multitude of elements, all essentially alike.

As is well known, a tree cannot grow without leaves. These are put forth every year, and are a contrivance for vastly increasing the surface.

An oak tree of good size exposes several acres of surface to the air during the growing season. It has been estimated that the Washington elm, at Cambridge, Massachusetts, not a very large tree, exposes about five acres of foliage, if we include both sides of the leaves.

Leaves are more nearly comparable to stomachs than to lungs.

A leaf is a laboratory for assimilating or manufacturing raw materials into plant fabric. The cellular structure of the leaves, wood, and bark of a tree, is too complicated a subject to be satisfactorily presented to a popular audience.

It requires a vast surface of leaves to do a little work. By counting the leaves on a seedling oak and estimating the surface on both sides of each, we can see how many inches are needed to build up the roots and stem for the first year. After the first year the old stem of the oak bears no leaves. It is dependent on the leaves of the branches, or its children, for support. A tree is a sort of community, each part having its own duties to perform. The root hairs take up most of the nourishment; the young roots take this to the larger ones, and they in turn, like the branches of a river, pour the flood of crude sap into the trunk, which conveys it to the leaves, which are the workshops of the plant body. The trunk and main branches also support and hold out the young branches, which put forth the leaves. The assimilated or digested sap passes from the leaves to all growing parts of the plant, and a deposit is made where most needed. If a branch is not much exposed to winds the base of it has a certain support or certain amount of nourishment; so with the trunk of a tree. If the base of a branch or the main trunk is much exposed to the winds and storms, a much thicker deposit of food is made there. The winds give a tree exercise, which seems good to help make it strong. Our toughest wood comes from trees growing in exposed places.

There is strength in union, and in attempting union there is likely to be some discord. The limbs of a tree are all the time striving with each other to see which shall have the most room and the most sunshine. While some perish in the attempt, or meet with only very indifferent success, the strongest of the strongest buds survive.

A tree is somewhat like a community of polyps which are attached to each other. By the way, a polyp, or coral, is not an insect, and does not toil like a bee or ant to gather stores and heap up a mound in the sea. A polyp simply eats and grows, and the mounds in the sea are the combined accumulations of many skeletons of polyps.

On the coast of South Carolina is an animal called Renilla. It is about two inches in diameter when expanded, and not far from a flattened sphere. It is a soft fleshy mass, consisting of a sack with one slender foot, which extends into the sand. Over the top of the animal are 100 or 200 little polyps, each of which has its own arms, its own mouth and stomach. Each mouth eats all it can get, and besides supporting its own body, pours a portion of the digested mass into the general cavity for the general good. A part also goes from the general body to support some of the unfortunate polyps not finding enough to eat. Each individual is here taxed just in proportion to his success in life. This is a good model for any State or nation.

Again, all these polyps own one general body which owns one foot. They must all agree as to when and how and where this foot is to be moved, or else there will be no motion forward.

It has often occurred to me that if our theologians knew more about the structure and growth of some of the lower animals, and the plan on which plants are constructed, they would put much less stress on what constitutes an individual. In this case there would be less disagreement between Unitarians and Trinitarians. There is much difficulty in determining what constitutes an individual in plants or some of the animals.

A phytomer in the higher plants probably comes as near as we can get to an individual.

The structure of the stem of a tree is quite complicated, and my time is too short to speak of the details.

Instead of the oak, I have an illustration of the box-elder, which is somewhat simpler. Here is an illustration showing a cross section and a vertical section of a stem when one year old. It is composed of pith, wood, and bark. The pith is composed of thin-walled cells, which are not far from spherical in shape. The wood cells are mostly long, with thick walls, and have tapering extremities which over-lap each other. Among them are some very large and long cavities, called vessels, which were once separate cells. The ends of these can be seen with the naked eye in oaks and chestnuts, and are often called the pores of the wood. Running from bark to pith are the medullary rays. These are thin vertical plates in the wood cells, and constitute the silver grain of oak, maple, and other trees. The outer portion of the wood and the inner bark constitute the cambium layer. Every spring this cambium expands by a multiplication of cells, and makes a new layer of wood outside of the previous wood, and a new layer of bark inside of the previous bark. The layers of wood remain where they grew, the youngest and most active layers on the outside. The bark cannot remain stationary, but must give way for the enlarging trunk. In this way the bark stretches and cracks, and assumes a variety of forms peculiar to different kinds of trees. Outside of the cambium comes the liber made of short cells, with walls not very thick. Next comes the bast tissue, which is composed of very long cells, with walls which are very thick, giving rise to the toughness of the bark. Next comes the layer of thin cells, made green by the chlorophyl they contain. Then comes the corky layer, and last the epidermis. The epidermis is glossy as if waxed, as it really is in many places, to render it impervious to water. This is briefly the structure of a stem of the box-elder one year old.

In some trees the green layer near the outside continues to live and produces a layer of cork every year. In case of the cork oak of Europe, this is removed without damage to the tree every few years. In summer the bark can be peeled, as we say, because the cells of the new layer of wood are yet very thin and delicate. Some of them are ruptured and destroyed as the bark peels.

An internode of a young stem elongates for all or a good portion of its length as it is developing. A stem has a pith. A root has no pith, and elongates at the tip only. These are two of the leading distinctions between a root and a stem. Each usually adds a ring or layer of wood every year. In hot climates these rings are often very uncertain, and are unreliable for determining the age of a tree.

In hard wood the cell walls are thick; in soft wood they are thin.

In our climate where trees have a period of rest, it is usually very easy to tell the age of a tree by counting the layers of growth. In the early part of the season when growth is rapid, there are usually more of the large cells formed—the cells which make the vessels. Later in the summer the cells are smaller and do not, as a rule, contain any ducts or vessels.

The wood of a tree may be compared to a lot of hollow cones set over each other, the larger one covering all the rest. The cone consists of one layer only on the twigs of one year's growth. In a thorn the cone is quite tapering; in a twig of willow it is almost a cylinder.

After a time, varying with the individual tree and the kind of tree, some of the new or sap-wood changes its color and becomes heart-wood. The outer sap-wood is alive and helps the tree convey sap. The heart-wood is generally destitute of vitality, and so far as the good of the plant is concerned except to answer as a support, it might as well be taken away.

In autumn the leaves of our deciduous trees perish, and in most cases soon drop to the ground. Before perishing, much of the nourishment of leaves goes into the buds and branches. At this time the root hairs and many of the smallest roots also perish. There is a wonderful contraction of surface below ground as well as above ground when a deciduous tree prepares for winter.

Evergreens hold their leaves for more than one year; some for two years; some for three, four, five, six, seven, or more; but every autumn, or once a year regularly, one crop of leaves dies and falls. Deciduous trees are of a higher type than evergreens, whether we consider them botanically or artistically. They vary much more in appearance with the changes of the seasons.

I must say a few words about the construction of leaves in connection with these drawings.

As will be seen in running over the illustrations of our trees, but few of them have showy flowers. The tulip tree, perhaps, has the largest flowers of any tree native to Michigan, but even here the flowers often pass unnoticed. In this lack of floral display there is a sort of compensation. The tree has one kind of glory in its size and peculiar form.

Next to a good lawn of fine, well kept grass, trees are the greatest ornament to a place. Unquestionably a fine tree is one of the most beautiful objects in nature.

After the lecture closed, Prof. Beal was besieged with questions, but the hour being late, discussion was cut off and the convention adjourned until Wednesday morning at nine o'clock.

Wednesday Morning Session.

There never has been so strong an inducement for opening the morning sessions of our society promptly as at this Flint meeting. The high school, under direction of the principal, Prof. Gass, opened the meeting each morning with music, and the time for the school to open was at nine o'clock. So just at nine o'clock Wednesday morning, Vice President Abbott, of Lapeer, called to order, and after listening to appropriate music by the school, and joining with Rev. W. H. Shier in a few words of prayer, the regular programme of the day was taken up.

REPORTS OF COMMITTEES.

Prof. Beal, chairman of the committee on plants, asked leave to make his report. Permission was granted, and the report was read as follows:

The members of your committee find about thirty plants exhibited by Darwin Smith, of Flint. They are well grown, clean and thrifty specimens, and indicate that the owner loves his plants and knows how to take care of them. The specimens consist of eleven varieties of coleus, including the old and valuable Verschafeldtii, and a more recent one, the ornatus. There are eight varieties of geranium, including Happy Thought, Distinction, Asa Gray, Mrs. Pollock, and Rose. There are two begonias, one Farfugium grande, one Tradescantia, two Sedums, one Oxalis, one Vinca major, two Selaginellas, two Chinese primroses.

Considering the inclement weather and the risk in bringing out specimens at this time of year, Mr. Smith deserves great credit for his neat exhibit of plants. They are tastefully arranged on the front of the speaker's platform.

There is a single bouquet on the president's table, and it deserves the more attention, when we consider how it came there. It consists of a pink Camellia, a few flowers of Carnations and Ageratums, with leaves of rose geranium and arbor vitae.

Fanny Healy, of South Haven, the little daughter of Mr. Healy, of our executive committee, of her own accord selected the specimens and made the bouquet with her own hands, and then requested her father to take it to the meeting of the State Horticultural Society. Her delightful message has been delivered, and has been well received. All honor to the thoughtful little maiden who has set a noble example for others to follow.

How much better it would be if more of the daughters of Michigan would pay greater attention to raising plants and less to reading sentimental second rate stories; spend more time in the vegetable and fruit garden, and less time in thinking how they can spend money in extravagant dress. Happy is the family where children are taught to study the works of nature.

Respectfully submitted by your committee,

W. J. BEAL, *Lansing,*
E. LEVALLEY, *Ionia,*
J. J. ATHERLY, *South Haven.*

On motion of Mr. Pearsall, the report was accepted and the secretary instructed to place it in the printed report of this meeting.

Mr. Lyon followed with a report of the standing committee on

NEW FRUITS.

To the Michigan State Horticultural Society:

The undersigned, chairman of the standing committee on new fruits, would respectfully report that, owing probably to the paucity of the fruit crop of the State the past season, the members of the committee have failed to report any novelties as coming under their observation since the date of our previous annual report.

This is stated for the reason that, in submitting some account of my own experience in the testing of fruits comparatively little known in our State, it would be manifestly improper not to clearly exonerate my associates upon the committee from any responsibility for the statements I may think proper to submit.

STRAWBERRIES.

We will, in treating of this fruit, consider the varieties, as nearly as may be, in the order of their ripening; remarking, however, that owing to the exceptional character of the season, their relative periods of ripening will be very likely to vary in other seasons.

Philadelphia, which was received from Ohio, with no account of its origin, proves to be a vigorous, staminate variety; but, judging by this season's experience, unproductive and nearly worthless.

Black Giant is one of the numerous seedlings originated by Durand, of New Jersey. It is vigorous, moderately productive, and rich in color. Under ordinary treatment, in matted rows, it proves deficient in both size and productiveness. Staminate.

Early Canada originated with A. M. Smith, of St. Catharines, Ontario, in 1880. It ripens among the early sorts, and possesses some promising characteristics as a market variety. Staminate.

Longfellow originated with A. D. Webb, of Kentucky. It is very vigorous, and enormously productive; fruit very large, much elongated, crimson; mild and pleasant in flavor, and moderately firm in texture. It is a good amateur fruit, and will probably prove profitable for a near market. It may be classed among early varieties. Staminate.

Bright Ida is a variety originated by that notable hybridist, Chas. Arnold, of Paris, Ontario. Some ten or twelve years since he effected a cross between a foreign variety, Doctor Nicaise, and the Wilson. Subsequently, from the seed of the resultant variety, he produced several newer seedlings, this being one of them. The plant is vigorous, and bears very heavily. Staminate. Fruit large to very large; bright red or scarlet; moderately firm, and juicy, with a mild, rather rich flavor; one of the most promising market varieties.

Oliver Goldsmith originated in 1874, at Delaware, Ohio, from a cross of Chas. Downing and Monarch of the West. The plant is very vigorous, and a very profuse bearer. Staminate. Fruit very large, long conical, bright glossy scarlet, firm, moderately juicy, mild sub-acid, rich. Promising for either dessert or market. Staminate.

Kirkwood resembles Mt. Vernon very closely, and is by many thought to be identical with it. It is reputed to have originated with T. Bishop, of New Jersey, some time prior to 1880, from seed of Jucunda. It fails somewhat under a hot sun, bears heavily. Blossoms staminate. Fruit large, roundish conical, bright scarlet, lacks firmness; flavor mild. A market fruit.

Little's No. 10 is one of several varieties sent us for trial by the originator, John Little, of Fish Creek, Ontario. The original plant was found in a plat of Captain Jack, in 1880. It grows vigorously and bears heavily. Staminate. Fruit very large, short conical, much rounded, bright scarlet, not very firm, juice abundant, flavor mild, sub-acid. In both plant and fruit this is apparently identical with Cumberland Triumph.

Neuman's Prolific is the variety so popular at Charleston, South Carolina, where, as we suppose, it originated. The plant is hardy, moderately vigorous, pistillate, a heavy bearer of medium sized, bright colored fruit, which is too acid, indicating that it needs the warmth of the "sunny south" to mollify its flavor.

Warren originated with Longfellow, at Bowling Green, Kentucky, in 1876. It is vigorous, moderately productive, staminate. Fruit remotely conical, of medium size, dark glossy crimson, rather firm, juicy, mild, rich sub-acid. A fine amateur fruit; only lacks productiveness to adapt it to the market.

Reed's Kansas Mammoth does not withstand the hot sun—bears but moderately; staminate. Fruit large, but variable in size and form; dark crimson, light in shade, rather firm, moderately juicy, sub-acid, poor in flavor, and lacks productiveness.

Little's No. 5 originated in 1880 at Fish Creek, Ontario, by John Little, from seed of Jucunda or Colonel Cheney. The plant is moderately vigorous and productive. Staminate. Fruit large, long ovate conical, knobby, dull, light scarlet, moderately firm, and juicy; mild sub-acid; much like Kentucky.

Camargo is a vigorous, pistillate variety; bears thinly. Of little or no value, unless it shall decidedly improve in the future.

Queen of the West, notwithstanding its name, is reputed to be a New Jersey seedling. The plant is very vigorous; staminate; bears lightly. Fruit irregular in form, large, and bright in color; firm in texture, juicy, mild, pleasant sub-acid; very desirable if it shall improve in productiveness.

Turner's Favorite originated at Moorestown, New Jersey, about 1870. Plant moderately vigorous and productive. Staminate. Fruit of medium size, roundish, dark crimson, rather soft, juicy, mild sub-acid. A fine amateur fruit—may prove productive enough for market.

Hart's Minnesota proves only moderately vigorous and productive: staminate. Fruit large, irregular in form, dark crimson, firm, moderately juicy, acid. Of very doubtful value here.

Little's No. 14, originated by John Little, of Fish Creek, Ontario, is a seedling from Monarch of the West, originating in 1880. Plant of moderate vigor, a moderate bearer, pistillate. Fruit of medium size, roundish, very dark crimson, firm, juicy, mild, rich. A very dark, rich colored berry; so far hardly productive enough.

Triple Crown comes to us without a history. Plant vigorous, sets an enormous quantity of fruit, requiring a strong, rich soil, to perfect it. Staminate. Fruit of medium size, roundish conical, truncate, dark dull crimson, firm, very juicy, mild sub-acid, rich. Under high culture, will doubtless prove profitable.

Kinney's No. 10 is a Massachusetts seedling, vigorous, staminate, which offers little prospect of value, from lack of productiveness.

Glossy Cone, a New Jersey seedling of 1878, has little beyond the beauty of its fruit to recommend it; staminate; unproductive.

Louella, of (to us) unknown origin, is vigorous, a heavy bearer; staminate. Fruit large to very large, low conical, rounded, dark crimson or scarlet, moderately firm, juicy, sub-acid, sprightly, pleasant. More than usually promising for market.

Pioneer is another seedling, by Durand, of New Jersey. Plant vigorous, but burns badly; a heavy bearer; staminate. Fruit above medium size, globular, sometimes slightly necked, dull reddish scarlet, moderately firm, juicy, sub-acid. It may prove valuable for a near market.

Memphis Late, to us of unknown origin, is not vigorous, bears moderately, pistillate. Fruit of less than medium size, nearly conical, dark crimson, firm, very juicy, mild, rich sub-acid. An excellent dessert fruit.

Endicott is hardy, vigorous, and productive; staminate. Fruit large, truncate conical, with a slight neck, dull glossy scarlet, moderately firm and juicy, mild sub-acid. May prove profitable for market.

Garden, a seedling originated at Babylon, New York, from Monarch of the West, is moderately productive; staminate. Fruit medium, roundish, crimson, soft, very juicy, sub-acid. Of little apparent value.

Barnes' Mammoth is hardy, moderately vigorous, and productive; staminate. Fruit medium to large, roundish ovate, scarlet to dark crimson, firm, juicy, sub-acid. A market fruit if sufficiently productive.

Arnold's Pride. About 1870 that successful experimentor, Chas. Arnold, of Paris, Ontario, crossed or hybridized the Wilson with pollen of a then noted foreign strawberry, Doctor Nicaise. From the seeds of the resultant plant, he again raised a crop of plants, a few years later, one of which is that under consideration. The plant is exceedingly vigorous, and bears the sun perfectly. It is staminate, and produces enormous crops of fruit, which is of very large size, irregularly conical, inclining to cockscomb, dull scarlet to crimson, firm, moderately juicy, very mild sub-acid, pleasant. From its first full fruiting the past season, we regard it as the most promising market berry we have yet seen.

New Continental is only moderately vigorous and productive; pistillate. Fruit large, rounded conical, very dark crimson, very firm, juice not abundant, high sub-acid in flavor. A rich, peculiar looking fruit, but needs further trial to determine its value.

Crispin is perfectly hardy, of medium vigor, with decided indications of Alpine parentage; staminate. Fruit of medium size, conical or ovate, pointed, dark scarlet or crimson, soft, juicy, sub-acid. More curious than valuable.

Trinity originated with Mr. Huntsman, of Flushing, Long Island. Plant moderately vigorous, productive; staminate. Fruit often large, but variable; roundish, remotely conical, irregular, scarlet, soft, juice moderate, slightly pasty; flavor mild, pleasant, not rich. It apparently requires rich soil to insure productiveness.

Piper's seedling is an accidental origination by D. J. Piper, of Forreston, Illinois, in 1873. Plant hardy, very vigorous, and productive; staminate. Fruit medium, nearly round, glossy crimson, rather firm, moderately juicy, sub-acid. With its originator it is very productive, which is likely to prove true with us.

Kinney's Eclipse originated with F. J. Kinney, of Massachusetts. Plant vigorous, crop moderate; staminate. Fruit medium sized, ovate conical, glossy scarlet, rather firm, juicy, sub-acid. Of doubtful value; but productiveness may have been affected by the unfavorable season.

Huddleson's Favorite has now been several years before the public. It originated with a gentleman of that name, in Indiana, and is the result of a cross of Agriculturist upon Wilson, in 1874. Plant vigorous, a light bearer, pistillate. Fruit large, roundish flattened conical, regular, bright glossy scarlet, moderately firm, very juicy, mild sub-acid, very agreeable. It has superior qualities as a dessert fruit, but lacks productiveness.

Les Quatre Saisons is apparently a pure running Alpine. Its runners are almost threadlike. Plant hardy, slender, very unproductive, producing more or less fruit throughout the season; staminate. Fruit very small, long conical, bright scarlet, separating freely from the calyx, soft, pasty, mild sub-acid. Of no value, unless as a curiosity.

Mammoth Bush is a seedling of A. J. Caywood & Son, of New York. The plant is exceedingly vigorous, and bears very profusely; pistillate. Fruit very large, roundish conical, often cockscombed, bright scarlet, moderately firm, with abundant juice, sub-acid, pleasant. It grows very strongly, in enormous stools, almost without runners. A desirable variety where runners are to be kept off.

Brant's Giant is also a seedling by Durand, of New Jersey. Plant a moderate grower, and a profuse bearer; staminate. Fruit very large, irregularly ovate conical, glossy crimson, firm, very juicy, acid. More acid and brighter colored than Longfellow; otherwise much like it; equally productive, but slightly less vigorous.

Belle Bordelaise is another running Alpine, almost identical with Les Quatre Saisons; and, like that, of no value, except perhaps to the curious.

Brilliant is a seedling by Mr. Storer, of Ohio, originating about 1877, to 1879. Plant only moderately vigorous, bears lightly; staminate. Fruit medium to small, roundish conical, bright scarlet, rather firm, juicy, mild, pleasant sub-acid. Only valuable to the amateur. Too thin a bearer.

Prairie Queen is vigorous, a very light bearer; staminate. Fruit medium, generally globular or rounded conical, variable, dull red but glossy, rather soft, juice abundant, moderately acid. So far of very little apparent value.

Cetewayo is another seedling of A. J. Caywood & Son, New York. The plant fails in the sun, is moderately vigorous, bears heavily; pistillate. Fruit very large, quite irregular, normally roundish, generally cockscombed, often triangular, bright scarlet to dark crimson, firm, very juicy, sprightly acid. Has some very promising qualities for the market.

Emma is a variety of vigorous habit, moderately productive; staminate. Fruit of medium size, roundish conical to long conical, scarlet, rather soft, juicy, acid. Only suited for market, for which it lacks both productiveness and firmness.

Mount Vernon very closely resembles Kirkwood, and some persons consider them identical. This, however, is a seedling by Chas. Stafford, of New Jersey, introduced to the public in 1880. The description is very nearly identical with that of Kirkwood. The two possess valuable characteristics as market fruits.

Belle is a seedling of Mr. Moore, of Massachusetts, originated in 1876. Plant hardy, vigorous, a heavy bearer; staminate. Fruit very large, dark scarlet or crimson, moderately firm, very juicy, sub-acid. A showy market fruit. Valuable if sufficiently productive.

Phenomere is quite hardy, but on light soil lacks vigor, bears lightly; staminate. Fruit large, truncate conical, inclined to cockscomb, glossy scarlet and crimson, rather soft, juice abundant, mild sub-acid, pleasant. If a better bearer, it would be valuable for its extreme lateness. It ripened this season with Marvin, June 28.

Sucker State, judging from its name, should be an Illinois variety. Plant vigorous, bearing very little; staminate. Fruit of medium size, conical, rounded, scarlet, firm, moderately juicy, mild acid. Produces an abundance of plants with very little fruit.

Satin Gloss is a seedling, by Oscar Felton, of New York. It is hardy, a slender grower, producing very little fruit; staminate. Fruit small, conical, rounded, very glossy, scarlet, soft, moderately juicy, mild sub-acid. Too feeble and unproductive to be valuable.

Success originated with Mr. White, of Massachusetts, in 1876. Plant hardy and vigorous; unproductive; staminate. Fruit small, roundish conical, glossy scarlet, moderately firm, juicy, mild acid or sub-acid. Should this prove permanently late and sufficiently productive, it may become useful, and even valuable. It ripened the past season on the first of July.

RASPBERRIES.

Little's Black Cap originated with John Little, of Ontario, and was sent to us for trial in 1881. The plant is hardy, moderately vigorous, with rather slender reddish brown canes, almost without spines, which are purplish white; the one year plants have borne lightly the past season. Fruit small, round, glossy black, firm, seedy, juicy, acid, rich. In plant and fruit this is much like Davison's Thornless. It should improve with the age of the plants; if so, its value will doubtless consist in its earliness.

Florence is a yellow cap, of recent introduction. The plant is hardy and vigorous; the canes greenish or yellowish white, with strong white spines. It bears heavily. Fruit of medium size, round, orange yellow, darker when over ripe, moderately firm, seedy (as are all the cap varieties), juicy, sub-acid, sprightly. One of the best yellow caps.

Caroline, a yellow variety claimed to be a hybrid between Idæus and Occidentalis, roots from the tips, and also produces an occasional sucker from the roots. Brinckle's Orange, one of the most tender and fine flavored of the American seedlings, from Idæus, is claimed to be one of its parents by the originator, Mr. Carpenter, of New York. Plant hardy and vigorous, spines numerous. Fruit very large for a cap, round, orange yellow, with a slight white pubescence or bloom; flesh pale amber, tender for a cap; very juicy, mild, pleasant, sprightly, rich; pips very large, irregular; core large. Superior to all other caps for the dessert.

Reliance is a red variety, increasing by suckers. Although not new, it is apparently little known in our State. Plant hardy (at least at the lake shore), vigorous, and very productive. Fruit of medium size, round, bright red, faintly pubescent, flesh dull red, firm, juicy, sprightly, rich, sub-acid to acid. Valuable for either dessert or market.

Lost Rubies is a foundling, of unknown parentage, brought to notice by C. A. Green, of Rochester, New York. Plant hardy, vigorous, variably productive. Fruit of medium size, round, bright glossy red, rather firm, juicy, rich, sprightly; pips very large, irregular, channeled. Said to bear better when growing near another variety, to secure fertilization of the blossoms.

Thwack is a red variety, increasing by suckers, introduced by T. W. Foster, of Louisiana, Missouri, some years since. Plant hardy at the lake shore, vigorous, canes stout, brownish green, with few spines; very productive. Fruit large, ovate conical, bright red, with slight whitish pubescence; flesh pale red, rather firm, moderately juicy, mild, not rich. Praised by some as a market fruit in despite of poor quality.

Cuthbert, a comparatively recent red variety, originated with a Mr. Cuthbert, of New York. Plant hardy, very vigorous; canes strong, brownish white, with strong, short spines; bears heavily. Fruit large, roundish oblong, bright red, whitish bloom, bright red flesh, firm, moderately juicy, sub-acid, sprightly, pips medium, channeled. It fully maintains its eastern reputation in Michigan.

Henrietta is another comparatively recent red variety. Plant hardy at the lake shore, very vigorous; growth short, stout, with slender reddish spines; bears moderately. Fruit very large, conical, rounded, irregular, bright rich red, with slight pubescence; flesh dull red, firm, juicy, rich, sprightly, acid to sub-acid; pips very large, irregular; core long, conical. A superior dessert variety; not productive enough for profit.

PEACHES.

Dawson's Early is a variety little if at all known in Michigan. Specimens from our own trees ripened this season August 23. Tree hardy, vigorous, and apparently an early and prolific bearer; habit upright spreading; foliage crenate, with globose glands; blossoms large. Fruit below medium, round, compressed toward the suture, which is distinct, extending two-thirds around the fruit; color greenish white, dappled with bright red in the sun, and darker where much exposed; dots in shade many, red; basin a mere deepening of the suture; pubescence slight; flesh creamy white, with a tinge of green and red at the pit; tender, melting, juicy, vinous. sprightly; exceedingly pleasant; pit small, free. The variety proved to be free from rot, while the other early varieties were badly affected.

Specimens were received from W. A. Brown, of Stevensville, Berrien county, September 1, 1882, of a seedling peach originating with Orrin Brown, of which we submit the following description:

Tree hardy, with the drooping habit of Hill's Chili. Fruit averages larger than Hale's Early, which it closely follows in season of ripening, roundish, slightly compressed toward the suture; basin a slight depression in the suture; color creamy white, and red faintly mottled with darker red; pubescence rather dense; flesh creamy white, reddened at the pit; texture rather firm, juicy, sprightly, vinous; very good. Pit rather small, freestone.

White Rareripe. A tree received from an eastern nursery under this name has this year produced fruit, which we describe as follows:

Tree very vigorous, rather upright, with a few drooping branches; shoots pale green and purplish red; bears moderately as yet; foliage long, rather large, crenate, uniform; blossom small. Fruit medium in size, roundish to irregular oval, creamy white, pale, faint red in the sun; basin a depression in the suture; season in 1882, end of October; pubescence rather slight; flesh pale, creamy white, faint red at pit, rather firm, moderately juicy, very mild vinous, pleasant; pit rather small, light grayish brown, freestone.

On motion of Mr. Stearns the report was ordered placed in the printed proceedings of this meeting.

REPORTS OF OFFICERS.

The reports of the officers whose term expires with the annual meeting were called for, and first came the

ANNUAL STATEMENT OF LIBRARIAN.

To the Executive Board of the Michigan State Horticultural Society:

GENTLEMEN, I herewith submit to you my report as librarian of the State Horticultural Society, for the year ending December 1, 1882. The following number of copies of our State Horticultural Reports have been received and distributed:

	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.
On hand Dec. 1, 1881	9	77	17	17	129	726	678	473	1,513	850	.....
Rec'd past year....	.....	.....	.....	.....	5	.....	.....	.....	100	145	6,000
Total............	9	77	17	17	134	726	678	473	1,613	995	6,000
Distributed........	4	8	11	10	14	304	304	305	283	367	*4,035
On hand Dec. 1, 1882	5	69	6	7	120	422	374	168	1,330	628	1,965

* Includes 1,300 copies supplied Secretary of State for distribution to crop correspondents. See act No. 33, public acts 1881.

There have been donated to the library, and received through exchanges, the following:

Horticultural Reports.

Iowa—1881.
Indiana—1880, 1881.
Kansas—1881.
Kentucky—1881.
Massachusetts—1881, and pt. 1 of 1882.
Maine—1873, 1878.
Missouri—1880, 1881.
Michigan—5 copies 1875, 100 copies 1879, 145 copies 1880.
Montreal—1879, 1880, 1881.
New Jersey—1876, 1878, 1879, 1882.
Ohio—1 Vol. 1881–82.
Ohio (Montgomery county)—1881.
Pennsylvania (Fruit Growers' Association)—1881.
Province of Ontario (Fruit Growers' Association)—1881.
Wisconsin—1 Vol. 1879–'80, 1 Vol. 1880–'81.

Agricultural Reports.

Connecticut—1881.
Department of Agriculture (United States)—1880.
Indiana—1881.
Illinois—1880.
Kansas—1st quarter 1882.
Maine—1880.
Missouri—1878.
Wisconsin—1 Vol. 1880–81.

Miscellaneous.

Report United States Commissioners on Horticulture, Paris exposition.

Ornamenting Michigan school grounds.

Schedule of prizes offered by the Massachusetts Horticultural Society for 1882.

List of premiums awarded by board of managers American Institute, New York City.

Very respectfully,

FRANK W. KING, *Librarian.*

REPORT OF THE TREASURER FOR THE YEAR ENDING DEC. 1, 1882.

Officers and Members of the Michigan State Horticultural Society:

LADIES AND GENTLEMEN,—I take pleasure in submitting my report to you for the past year, because our finances are in a healthy condition, and there seems to be a cordial feeling in all parts of the State toward the Society, that will help to bear the financial burdens in the future. The dollar per year is but little for each interested horticulturist to give, and if all who are benefited by the work of our Society would come forward with the annual fee, there would be no danger of any embarrassment in our labor in the future.

Our Life Fund.

We have now one hundred and seventy-seven life members, eleven new ones having been added the past year, whose names have been enrolled as follows: James D. McDiarmid, Pleasanton, Michigan; E. W. Allis, Adrian, Michigan; Robert T. McNaughton, Jackson, Michigan; James Vick, Rochester, New York; Frank H. Vick, Rochester, New York; Charles H. Vick, Rochester, New York; E. Colston Vick, Rochester, New York; Mrs. W. K. Gibson, Jackson, Michigan; E. M. Potter, Kalamazoo, Michigan; Dr. Austin Scott, Newark, New Jersey; Chas. W. Garfield, Grand Rapids, Michigan. The fund is invested as follows:

The Seymour mortgage	$1,000
The Stearns mortgage	250
United States bonds	150
Note	100
Bank certificate	270
	$1,770

Receipts and Disbursements—General Account.

The receipts of the Society come into my hands very largely through the Secretary, who has more directly to deal with the sources of income.

Receipts.

Balance brought over from last year as per printed report in volume of 1881, page 361	$812 54
Annual memberships	106 00
Local societies	236 40
Reimbursed from Boston commission	8 45
Interest on notes, mortgages, and bonds	115 04
From ex-Treasurer Adams	100 00
From State Agricultural Society	800 00
Total receipts to December 1, 1881	$2,178 43

Expenditures.

Reimbursing life fund by order of board	$350 00
Forty-four checks paid to December 1, 1881	1,380 96
Appropriation for local society work	45 00
Total expenditures	$1,775 96

Total Receipts and Expenditures.

Total receipts from December 7, 1881, to December 1, 1882	$2,178 43
Total expenditures from December 7, 1881, to December 1, 1882	1,775 96
Balance in treasury at this date	$402 47

All of which is respectfully submitted,

S. M. PEARSALL, *Treasurer.*

Dated Grand Rapids, December 1, 1882.

SECRETARY'S ANNUAL STATEMENT.

My report this year will be very brief. The first annual statement I made, after being elected Secretary of this society, embodied a financial statement, a report upon library matters, as well as suggestions for future work. The Treasurer will this year make a very complete report upon the first; the Librarian's statement relieves me from any reference to the second, and our worthy President has already taken care of the last, so that really I have little ground to cover.

Board Meetings.

The Executive Board has held six sessions since we last convened in annual meeting, as follows:

December 19, 1881, in Jackson.
February 27, 1882, in Jackson.
March 1, 1882, in Hudson.
June 23, 1882, in Pentwater.
September 19, 1882, in Jackson.

The December meeting was fully reported in our volume of 1881. The February meeting was occupied wholly with matters connected with the State fair. The March meeting ordered 1,000 of our school pamphlets issued, and the June meeting placed at Pentwater. The June meeting was quite an important one; the place of the annual meeting was decided upon; the compensation of the Librarian was placed at $50.00 per annum, to be paid quarterly. Mr. Chilson's resignation was accepted, and Mr. J. N. Stearns appointed to fill the vacancy; Mr. Guild's resignation was accepted, and the appointment of a successor left to the President, the vacancy being subsequently filled by Mr. John Abbott of Lapeer. The Business Committee, through its resignations, was broken up and reärranged, with Mr. Scott, of Ann Arbor, as Chairman, and Messrs. Satterlee and Stearns as associates. At the September meeting matters connected with the details of the fair occupied the attention of the Board. An invitation from the Calhoun County Agricultural Society, to hold our February meeting in Marshall, was accepted; reports of the President as delegate to meeting of Mississippi Valley Society, and of the Secretary as delegate to American Forestry Congress, were received. It was also decided at this session to have the next issue of our fruit catalogue in 1884. Early in the year the Board set aside $100, to be drawn upon by the Secretary at will, for the purpose of prosecuting local society work, $45 of which has been used.

Branch Societies.

Several auxiliary societies have been formed during the year, and are flourishing. More compliments have come to our society, in consideration of this united work, by all horticultural organizations in the State, than for anything else we have ever done.

I confess to becoming discouraged occasionally in connection with this work, because of the difficulty of enlisting a few persons in each locality who will shoulder the burdens and push along with the work, independent of any stimulus from the State Secretary. The State Society can take the responsibility of starting societies out, and keeping them acquainted with its own work, giving them a place for their transactions; but inasmuch as the services of the officers are very largely voluntary, it is impossible to act as a special float for each branch. My own impression is that the fault in the organization of local societies lies in the fact that so few ladies and young people are made interested in the work. Horticulture, in its broadest sense, should be the field of these organizations, and horticulture has to do with every inmate of the home, from the youngest to the oldest member. There are so many societies now in the interests of various undertakings that horticulture is apt to be neglected, but I find it true, that to those who are building houses, no topic proves more entertaining than methods to be pursued in rendering the home more attractive.

In any town in this State it would be profitable to have a horticultural society that should meet and discuss gardening, tree planting, green-housery, house building, etc., etc., at least four times in each year. The society should not be confined to a few people that are making a living by growing fruits, but should include any one interested in making homes attractive, and bringing about them the luxuries that horticulture affords. I hope that the coming year many others will be added to those we now have.

The State Fair.

The State fair this season was a great success in all its departments in our charge—we never had, taken altogether, so excellent a show. The success in this unfruitful year was largely due to the public spirit manifested by the florists and amateurs interested in the growing of plants.

Our Reports.

It is a subject for congratulation that our volumes are so well spoken of everywhere. More complimentary notices and letters were received by me this year mentioning our 1881 report than during any year since I have been connected with the society. But as the years go by, it is more and more difficult to arrange programmes for our meetings, and select matter for the reports that shall be bright, sparkling, and interesting. It requires more thought and more time for the secretary to so build up a volume that it shall deserve the best notices of the press, and the best words from leading horticulturists. Still our aim should be nothing short of this.

As a result of our work the number of inquiries after locations in our State for the building up of homes by people who have horticultural tastes is constantly increasing; and to so advertise our capabilities and peculair climatic conditions favorably to immigration of this character is a worthy subject of our study and work.

Things That are Talked About.

The question of having a State Entomologist is talked about more or less by every branch society in the State, and soon we shall come to the place where we must have such an office. The newspapers that come into our homes are severely criticised by many of our leading horticulturists as not giving bright, fresh matter in the interests of horticulture. The fact that most of the enthusiasts in horticulture are people with gray hairs is commented upon unfavorably by many. It is argued that our young people who are fresh in hope and desire to do what they can to make the world more attractive, a more beautiful place to live in, should be among the foremost in horticultural interests. Timber planting is a matter of growing importance that is awakening increased interest with each year. The breeding of good seeds is a question that our most progressive horticulturists are talking about a good deal, and after all our agitation, I do see a greater interest in the beautifying of school grounds and public premises.

Financial Report.

As secretary of the society I draw all the checks and keep a record of them as well as a file of the vouchers upon which the checks are issued. I also classify each bill as it is audited, and at the close of each year it is a very simple matter to give the aggregate of the checks drawn during the year and the classification of disburements.

I keep no record of the receipts of the society. Although a majority of the money going into the treasury goes through the hands of the secretary, still there is a part that does not. However as a matter of record I take receipts from the treasurer whenever moneys for memberships, etc., are paid over to him. The following is a complete classified

Statement of the Disbursements.

President's office	$24 18
Secretary's salary	600 00
Treasurer's office	1 37
Librarian's office	43 00
Advertising, circulars, etc	2 25
Printing, stationery, and blanks	23 50
Executive board	160 19
State fair	262 34
Fruit catalogue	103 75
Report 1881	26 20
Report 1882	5 00
Back reports and exchanges	16 45
Local societies	46 05
Incidentals at quarterly meetings	22 75
School ground work	42 75
Postage secretary's office	25 68
Premiums	14 50
Seal	6 00
Total disbursements	$1,430 96

The above does not include $350 transferred from general to life fund. It does include $45 voted by the executive board to be used for local society work, which amount was transferred from the treasurer to the secretary without a check, but for which the treasurer holds my receipt as his voucher.

How our work is to proceed.

Our work must depend very largely upon the acknowledged and known wants in localities. The more we know about any county in the State the more we can do for it. Our aim should be to get at facts concerning every portion of our State. These are necessary to the accurate building up of our fruit catalogue, and the spreading of exact information that shall bring into the State the best people. I do believe we are on the right basis of operations to secure the best results. The question is how to establish and increase the interest in the objects we have in view.

The reports of the officers were, on motion of Mr. Crozier, accepted and ordered placed in the printed transactions of the society.

Election of Officers.

The hour having arrived for the annual election of officers, several gentlemen took the floor at once, and all seemed desirous of saying about the same thing,—that the society had a number of excellent papers yet to hear, and there was no use in wasting time in balloting separately for the officers when everybody was satisfied with the gentlemen that at present filled the positions.

Mr. E. F. Guild of East Saginaw finally succeeded in maintaining his position upon the floor in advance of others, and after special recognition by the chair moved that Mr. E. H. Scott be authorized to cast the following ballot:

For President—T. T. Lyon, South Haven.

For Secretary—Chas. W. Garfield, Grand Rapids.

For Treasurer—Sherman M. Pearsall, Grand Rapids.

For Members of Executive Board—James Satterlee, Lansing; J. N. Stearns, Kalamazoo.

For Member of Executive Board to fill vacancy—John Abbott, Lapeer.

The motion was supported by a number of gentlemen and unanimously carried by the convention.

Mr. Scott carried out the instruction of the society and the above named officers were declared elected.

The following paper was presented by Mr. B. Gott, our visiting member of the Ontario Fruit Growers' Association:

"FRUIT CULTURE AND CHARACTER BUILDING."

BY B. GOTT, ARKONA NURSERIES, ARKONA, ONT.

Friends of the Michigan State Horticultural Society:

GENTLEMEN,—I am pleased to be present with you at your annual meeting. According to my text, which may be a little one side of your programme of subjects, I am to present to your attention for a short time the bold and beautiful figure of Pomona as a character builder. This noble nymph is to be employed upon us in our most important interests, namely: our character for this world and after. Block upon block, block upon block is deftly and securely laid in its place in the structure, by her skillful and accomplished hands, as it rises in high and noble symmetry until the apex is reached, and all beholders cry out glory, glory, unto it. This work of character building is one of the greatest importance to us in our most substantial and vital interests, and we may recognize many powerful forces being engaged upon it. For the sake of contrast we may just glance at some of the foremost of these for a moment or two; and first,

THE FAMILY.

This is an influence of pervading force in the formation of all character, and in the present state of things there can be no character formed without its intervention. Its influence is formative and assimilating, and it is the embodiment of first principles in pure government. In the development of the manly virtues it is the fundamental training school, and its power and influence is very generally felt and acknowledged. Under its kind and fostering care the graces and accomplishments of men are all implanted and sunned, watered and nourished into being and full development. In the very infancy of our being, long before there is a trace of manly character upon us, the influences of the family are acting upon us as the sunshine upon the tender plant, until the feeble germs of our life are fanned into being. But the ever present influences of the family do not stop here; they follow us still as a refreshing stream in the wilderness, or as the ever present sunlight, to cheer and to guide us in our onward course. Here tenderness and love and good will to all, as formative blocks, are firmly laid in place, not in bricks and mortar or perishable material, but rather in the still more solid depths of the human heart. Happy is the man who, in his early life, has been cultured and trained amid the golden influences of a good and orderly family. But second,

THE CHURCH

As a builder of human character, is still more marked and important. She builds with super-human material a something that cannot be dug from the mines of earth. She takes the work in its incipient steps and adds to its beauty and its glory. Solid are the blocks she lays, and deeply and firmly placed. Universal charity, temperance, love, faith, and hope, with these and similar blocks she builds us up until a proportion and an elevation is reached that is indescribable to a fruition that is never ending, and to the grandest results it is possible for human character to attain. As a guide she takes us by the hand, and safely leads us through the wilderness of this world by all the snares and pit-falls of human life in perfect peace and perfect safety, up to the fields of richest green. The church, firm and deep be her foundations over this broad land, and let her ennobling and christianizing influence be over all classes of the people. But third,

THE STATE,

As a character builder, we cannot well afford to overlook the salutary influences upon us of our country. Patriotism is amongst the noblest aspirations of the human breast, and poets have dilated upon the theme in some of their best and most enduring efforts.

> "Lives there a man with soul so dead,
> Who never to himself hath said
> This is my country, my portion fair;
> My treasures and my hopes are here."

Under the fostering care of the State all the manly and the christian virtues flourish, and are nourished into the best of results for the individual character, and for herself. The love of country begets devotion to her best and highest interests, and love and zeal in her service, and the gracious results extend through the whole mass of society to its lowest integral elements. If any people under the broad vault of heaven have laid upon them the best of reasons for habitual gratitude for blessings of country, surely we are that people. Protected as we are in all the rights and privileges for the highest and best development in all the noble virtues of our race, it surely becomes us to give our best aspirations and efforts to the country that has such claims upon us.

All these and many others that might be particularized, are powerful influences in the formation of character, but the work of Pomona upon us is in some respects distinct from them all. Helped by these she is not supplanted; she is working up a character that neither family or church or State have it in their power to develop. She finds her material in actual contact, and builds us up in real service. Her pupils are brought in contact with nature and stubborn facts, and are made to feel their weakness and utter helplessness without her aid. She acts upon us by a sort of reflex action, and the intensity and devotion of our work for her is the exact measure of her ennobling influences upon us. Her services are paid upon us by the richest and most satisfying returns, and the more we do for her the greater and more blessed are the returns. The more we do for her the more we are enabled to do, and the more we want to do, and thus our character is firmly established by actual service. Character is literally the distinguishing marks of personality that separate men and indicate the internal principles of their actions, and is as variable as are their mental compositions. It is that by which we are individually "known and read of all men." When a man is firmly settled in his principles of action, and is indicated by his daily life among his fellows, he is said to possess "real character" in contrast to "estimated character," which is simply character in its transition state, and unattained. Character may be of all degrees of excellence, according to the mental calibre and principles from which it springs, from the lowest to the highest developments. It is something that can be cultivated; something that can be attained; and, therefore, we are each and all of us responsible for our character. A noble character is permanent wealth, and a blessing to our country and race. Although we, as a people, do not recognize an aristocratic nobility as a standing institution of this country, yet we do recognize and properly value nobility of character, and we are most happy to know that it is a product that is within the possible of development in the happy homes of many of our people. This kind of character is very acceptable, and always necessary for the best results in society or in business. A man may be gifted with the finest intellectual abilities from his birth, and be possessed of many fine personal attractions, accompanied by a large and ample inherited fortune to gratify his utmost ambitions, and may be the heir of a titled peer, but without a

WELL FORMED CHARACTER

They will all in the end slip from under him, as a stone from under the wall, and leave him but as a tottering fence, and a shattered piece of ruined humanity. Fruit growers of our country! I appeal to you, when did you ever know one of your number who, being intelligently devoted to his business, was shipwrecked by it either in character or in fortunes? Have not the very elements of our business in the very nature of the case a tendency from the beginning to form and ennoble character? I know in all my large acquaintance one man with a coarse and ungenerous nature, who took up gardening in as fine and favorable spot of earth as the sun shines upon, but he was not a success! Another born to as fine and lovely inheritance in one of our nurseries as it is possible for human desires to reach, and yet is but a moral failure! Do not facts of observation in every day life like these sufficiently establish the case that without a settled character for honor and nobility, the fairest prospects are but abortive? How often have I lifted my heart in thankfulness to the "Giver of all good" that I had a business, and that my business was at once so pleasant and so fruitful of good! Can you not all, as fruit growers who honor your business, agree with me in this pure sentiment, and be thankful for the reflex influences of your pleasing business upon you?

But to approach our subject a little nearer and particularize. The cultivation of intelligent thought is doubtless the real key of all real success in life. What marks the differences between men, and makes one man more exalted and noble than another, is thought; deep and well directed thought; as Scotland's bard has truthfully and characteristically said, "'Tis the mind is the measure of the man." How friendly is the atmosphere of the garden for retired and contemplative thought. Poets have sweetly sung of her "secluded bowers," and we all find in actual life, that here in our daily duties with the soil, and with the mysteries of vegetable life, we must think, and think successfully, to make any headway. But compared with some of our modern schools of learning, how easily and cheaply we are taught to think in the garden, the orchard, or the nursery. How testing and trying, how educating and ennobling is the kind of thought that must be daily and hourly practiced. Just what is needed to bring out and develop a full, sound, and complete manhood, is the tuition that the practical horticulturist is subjected to. Here even the poorest, and the man without the advantages of accumulated fortune, may come to this accessible university and daily drink in lessons of practical and applied wisdom. If one wishes to become a professional lawyer or doctor, a minister or a teacher of our children, he usually finds at the very threshold of his desires a very formidable difficulty, and unless his kind friends come timely to his assistance, a difficulty that he is powerless to surmount, and the whole scheme proves abortive, and a valuable life is lost to the world. Is this fearful difficulty standing at the threshold of the Temple of Pomona? No! we have not found it so. Here a willing and apt scholar may, without let or hinderance, "walk in" and work out for himself a niche in the temple of fame. Intelligent, thoughtful study is the key to success, and the gracious sunlight that stimulates the growth of all the manly virtues. Second,

MANLY INDEPENDENCE

Is a foundation stone of first importance in the structure of high and noble character. Without it nothing can be achieved either for the man himself or for his fellows. The man simply becomes a great weight upon the progress of society, and a mere parasitic sucker upon the productive industries of his time. Under the progressive influence of this noble and essential trait of character, how it is built up! And how the man goes on from step to step in his high development to be an honor to himself and his country! Fruit growing and general horticulture, in our humble opinion, is the very best means for the healthy growth of the muscular and mental systems, and by this means the manly independence of our citizens is fully and palpably brought out. The man is made to feel from the beginning that if ever he succeeds in his business, it must be by his own well applied efforts, and by these alone. Some difficulties there are to be overcome to develop manhood in the tussle, and some disappointments to be met with a firm and resolute will, before the prizes can be obtained. But is our favorite art alone in this? I know you will not be deceived. A few days ago a gentleman said to me: "I think, Mr. G., that you make a good living easier off your small farm than I do off my large one." I mildly replied: "I beg to inform you sir, that you are entirely mistaken, as it is not by any means a question of easy living, but a question of skillful application. If you would apply yourself as thoroughly to a quarter of your farm as I am obliged to do, and manage it as well, you could most likely live just as easy as I do." He seemed thankful for the advice, for it was a new idea to him. But thirdly,

INDOMITABLE PERSEVERANCE

Is another sure mark of the successful fruit grower. This arises from the very nature of the business and its condition. If our plans like the morning dew or the early snow soon melt away, failure is absolute and certain, and nothing can save us. The opposition and the trials that arise on the horizon of his operations to threaten the dissolution of his plans, must be met and manfully overcome. Let nothing, therefore, daunt you in your work, but fix your plans cautiously, wisely, and well, and follow them out to their legitimate results. If in any department of life push is necessary. most certainly be it understood it is here. Fourth,

INTELLECTUAL CULTURE

Clearly marks the successful fruit grower. This is a fine and noble trait of character, and qualifies the subject for usefulness, and for the society of his fellows. It is somewhat different from our first proposition, as it indicates results rather than means. It is the end to be aimed at by thoughtful study and a polished stone in the structure of human character. What is equal to the modern art of fine fruit growing, among the useful callings of our times for the attainment of high intellectual culture, as a personal adornment? In the practice of our art, nice discriminations are to be made, fine operations practiced, means adroitly suited to ends to be attained, differences are to be observed in soil, culture, climate, and results; qualities are to be nicely estimated and valued in the fine products of his care, and good judgment must be had in the disposing of his fruits, and an affability cultured towards his fellow. What, I may ask, combines so many and so fine advantages for the cultivation of every faculty of man as our popular art? No art like ours gives such grand and frequent opportunities for observations upon the varied beauty and grandeur of the insect world. From the earliest of the season to the end of it, what a gorgeous and successive panorama of insect specimens in their brightest hues, and the developments of real life, are constantly brought before us. Beautiful moths and their destructive larvæ, exquisitely colored butterflies and their numerous progeny, in all their multitudinous and mysterious forms, more or less frequently come under our observation during each successive season. Think what an element this is in high intellectual culture, and what it is worth. Why, if many of our enthusiasts in science had half the fine chances for observation that daily pass by us, they would be ready to think that they were the favored one of all their brethren. Let us open our eyes to these beautiful attractions, and profit by them as it well becomes us. Fifth,

BUSINESS TACT.

It is needless to come here among you as a body of fruit growers, and to think I could teach you anything either of the nature or the practice of this trait. It means something that you all know is indispensably necessary to success in any business, but more emphatically so in this. Woe be to the man, whatever be his station in life, who launches out in business without it. The absence of it means certain failure, while the possession of it just as surely means success. What can you put your hand upon that will so quickly and so effectually develop this fine and valuable trait of character like the practice of fruit growing? Sixth,

HABITUAL INDUSTRY.

I am afraid that I shall be in danger of provoking the smiles of some at the bare mention of this as a valuable trait of character. It implies something that I know to be unpopular, especially amongst the young of our day. But you who are fruit growers know the worth of it, and how you came by it, and what it has done for you. If we mean to attain anything that is valuable, we must work for it. Only disgrace and ruin in character and fortune come by doing nothing. Be not deceived, my brethren, "from nothing, nothing proceeds," and without a settled habitual industry, there is not the spectre of a hope for many of us. It is an old doctrine "That labor is the source of the wealth of the State." If this is so, how much of the wealth of the State do you own? Some of you who are successful fruit growers, I know could own much, but labor is also her own reward, and in proportion as "Her labors rise, so her rewards increase." So each of you get the rewards of your labor, whether they be many or few. Work on then, you faithful fruit growers. Weary not nor faint, for your rewards will come. Your habits of industry which you have so carefully cultivated shall be to you as a never failing bank of resources. To the man who is ashamed or afraid of honest labor, let me say, keep clear! Never enter here! for there are no laurels for you in your unproductive and useless life. But seventh and lastly,

PROUD SUCCESS.

What is more inviting, more captivating than a climax like this? Is it not what we all labor for and so much desire? Statesmen, lawyers, poets, artificers, menials from the highest to the lowest ranks of society, what but for this are you straining every nerve and jeopardizing even your lives? Farmers, fruit-growers, educate your sons to love fruit and to be skilled in its production! To all enter these fair and beautiful fields and work while it is day. Devote your energies to the good of your species, and to the production of beautiful fruits, and your success is certain and your rewards shall follow you.

Having just glanced hurriedly at some of the more prominent of the manly virtues brought out by the practice of fruit-growing in our country, I wish as briefly as possible to glance at a part of the subject that I have long had in my contemplation, and which, as far as I am aware, is not well brought out by any of our horticultural writers. It is

FRUIT AS A CHARACTER BUILDER

In its integral elements. I do not know whether I shall be enabled to make this quite clear to your understandings, but I will do as well as I can. I mean by it to say that by the habitual use of fine and savory fruit in our food, and as our food, our temper and dispositions, which are so much depending for their character on the quality and attributes of the food taken into the system, and assimilated by it, will, by it, be modified, and, as it were, tuned, and our outward character being an index of the inner will be thus determined. We hold that fruit, in its very elements, is not intended merely as a luxury, that we can do either with or without, as the case may be, but rather that it was intended by the "Allwise Maker of our frames," and by our intuitive desires, to serve a felt and important purpose in the economy of nature; in short, that it is to be a necessity. It is to be used by us as a daily food, a something to nourish and build up the bodily parts, to modify and form the tastes and dispositions of the growing man, and help in the development of him as an intellectual and moral being, fit to adorn society by his fine personal character. We hold, further, that the habitual use of fruit will be felt as an influence in the formation of those fine tissues and organs of the body, as the organs of the brain and the nervous system which exert so powerful an influence over the whole life of the man, and is clearly revealed directly in the life. It is surprising to ordinary observers how far a class of food will constitute the "make-up" of the man, and determine his character. In your daily observations among men, you all of you doubtless, may have noticed instances of this sort. We do not wish to say, however, that noble character is entirely dependent upon the nature of the food used by the man, as there are so many subtile influences that go in the general make-up of human character, some of which it is very hard to trace, but we do mean to say, that the question of food is a very important ingredient. There is also another important point in connection with this interesting theme that we cannot well afford to pass unnoticed. It is, that fruit is the best

ANTIDOTE FOR THE USE OF ALCOHOL.

This question, so important in the present state of society, is yet in its infancy, but it doubtless has much strong argument in its favor. You all know that as a people we are excessively addicted to the habitual use of alcoholic and stimulating drinks. The trade in these drinks enters more or less into every avenue of life, and they are used by all classes of society. The great arguments used in support of this practice is that they are a necessity to our well being under our peculiar climate and circumstances. This argument holds undisputed sway, and the manufacture and use of stimulants goes on increasing from year to year, until none can tell with any degree of certainty what the result will be. But amongst the deeper and better thinking part of community these premises are seriously questioned, and they deny that alcohol is necessary, or that it is requisite to our welfare, and we very much sympathize with them in this. We go on further than this and assert not only that it is not necessary to our well-being, but that it is the direct cause of our physical and moral degradation, and consequently something that must be shunned if we would succeed in life. The use of alcohol is now felt to be an evil, and so subtile is it in its effects upon us that it has now by inveiglement got itself into every business interest of our country and times. We have found in experience that the difficulties of uprooting and banishment by act of Legislature are formidable and partly unsuccessful. If the habitual use of fruit as a food and a natural and mild stimulant was adopted by our people as a means to an end, how easily would this interesting question be dealt with? Our beautiful, rich, and luscious fruits contain so many excellent qualities, mildly stimulating and enlivening, that did we but know them by habitual use, we are confident to assert that the use of alcohol would be felt to be not only unnecessary, but as it really is, a poison and an absolute injury to our vital interests. Fellow fruit-growers, have you ever thought over this question deeply and seriously? If so, what do you think of it? If this is practical, and we think it is, are we not on the high road to the most wonderful achievements for our generation that it is possible to work out? It is worth working for, for it points to high possibilities in the not very distant future. Already these effects are distinctly marked upon the business itself. In my large acquaintance with the fruit-growers of our time, I am most happy to be able to record that I know of but few who are either habitual gluttons or habitual drunkards among the ranks. This is a good mark, and let it score one for us. We will labor to preserve it intact as a distinction of our noble industry. On the contrary contentment, prosperity, and happiness in our calling, and in our families seems to be everywhere the rule amongst us. Thanks for this assurance, it should make us deeply grateful. We have one more proposition, and then we are done, namely: "Fruit is a necessity for

"OUR MODERN CIVILIZATION."

This by itself is a fine theme, and sufficient to occupy our best attention. It is fully established by our previous questions, and by our daily observations everywhere. Our modern civilization! How grand and how noble are its amazing achievements! But what could it do without fruit? Its very foundations would be undermined, and its fair temple would totter and fall a mere wreck. Everywhere, and among all classes, there is a deeply felt need of the rectifying and refining influences of good fruit; fruit that is worthy of our times, and worthy of ourselves. There is no exception, all need it, both male and female, both old and young, both bond and free, both black and white, the sedate and the gay, the learned and the illiterate, the wise and the otherwise, the master and his scholar; and from whatever country or nation or tongue they may have sprung, all need it; and for their best interests, all must have it. In the very nature of the case its use will constantly increase as our civilization goes steadily on. Fruit first acts with powerful force upon our civilization, and in turn our civilization acts, or rather re-acts, upon fruit. The fruit gives tone and force to the civilization in her onward march of progress over the masses, and the civilization in turn helps and encourages the fruit. You see it is a well balanced mutual progression, in which the parties go hand in hand, the one cannot advance without taking the other kindly along. Have you faith and confidence in the results of our civilization? Have you equal faith and confidence in Pomona, and encourage her to the utmost of your ability, for she is the hand-maid of civilization. Bring to bear upon her interests the deep and interesting researches of science into the hidden mysteries of nature, and in her latest and most matured investigations. You need her assistance, and to science you are indebted. Do you not grow more and better fruit now than you did years ago? I am afraid there is something wrong if you do not; more and better is needed. Science is advancing; civilization is advancing; knowledge is advancing; the arts of life are advancing; and the noble art of growing ample fruit for the uses of all must be advancing, or where shall we hide our heads for very shame? The use of fruit is increasing with our prosperity, and growing with our growth. Where is the supply to come from if we are listless and inattentive to the urgent demands of our business? To encourage us in this matter,

WHAT HAS NOT NATURE DONE FOR US?

Has she not given to us as fair and fruitful fields as ever fell into the lot of man to possess, or that the sun ever shone upon? Does she not give us as copious and timely or luxuriant rains, and refreshing and richest dews, as ever fell on fair leaf or flower? Where, in all the fair fields of creation on the bosom of this beautiful earth, will you find such bright and genial sunshine as is the lot of our inheritance? Where will you find balmier breezes and finer adapted conditions for varied plant growth than on the surface of our never failing fields? Are not all these great natural blessings just the conditions exactly suited for the fullest and purest development of the handsomest and most tempting fruit that ever touched the lips of dignified manhood? Talk about the products of the glass fruit houses of Europe for their nobility! We don't need them, we can do better. The open fields are our fruit houses, and the broad canopy of heaven is their enclosure. Oh, my friends, if you are not successful in the production of the finest and best of fruits in abundance, that will favorably compare with those of nearer or farther India, or of the Gold Coast of America, it must be on account of your lamentable inattention, and the cause must lie at your own doors. In conclusion let me say study the nobility and usefulness of your work. Let it produce upon you its true and legitimate fruits of good living. Yield to no discouragements, but with fresh courage take wider strides and broader and deeper views of the nature of your business. You will ultimately triumph and become the acknowledged benefactors of your race and times.

DISTRIBUTION OF REPORTS.

J. D. Baldwin: I notice by the librarian's report that there are a large number of volumes in our hands, of the different years since and including 1876. Why not disburse them to counties where we have no society, as a benevolent enterprise; get them into the hands of men in the newer parts of our State that cannot afford to pay the dollar a year, but who will by and by, and will, after getting a volume or two, be glad to "chip in" and secure them regularly.

Secretary Garfield: That is just what we have been doing the past year in a number of instances, but there are two things we have been trying industriously to secure: First, the organization of branch societies wherever we can: Second, the placing of volumes where they will be appreciated and used. The volumes are not issued to simply fill up library cases, but for assistance to those who need it. Mr. Baldwin will see, by the report of the librarian, that there have been distributed a large number of the best volumes during 1882, and even more will go out probably in 1883. The supply will not last long, and we must remember that some of our brightest fruit-growers are those who come into our State from outside to pursue their chosen calling here, and are eager to get our volumes. We want, for years to come, to be able to supply those people.

Of these new comers there are many in our State to-day who would gladly pay an extravagant price to complete a set of our volumes, but we can only assist back as far as the volume of 1876. It seems to me our aim should be to do all the good we can with our reports, but avoid as far as possible any abuse of them. Only a few years ago a box of one of our earlier volumes was sold for waste paper in Benton Harbor. To-day there are fruit-growers who would gladly give two or three dollars per volume for every one of them. I think we are gaining upon this matter. We are glad to have as good a fruit grower as Mr. Baldwin,—one we know will be discreet,—send our volumes away to men he knows will be benefited, and who are not as yet in circumstances to pay the annual fee. But if I should advertise to do this by every one who might apply, I will venture an estimate that not twenty-five per cent would go into worthy hands, and we should be left without a copy in our possession.

Mr. LeValley: I heartily concur with the Secretary in his opinion. Our work should be supported by the men who are most benefited, and any fruit grower who can not, or will not, pay a dollar a year at least, under the present arrangement with local societies, by which one-half the dollar is retained by the local branch, ought not to have a volume. The man who demands a volume because the State prints it, and is unwilling to do his part toward the expense of building up the volume, is, to say the least, swinish in his nature. The State of Michigan has reaped its reward thousands of times over for the amount it has put into the mere printing and binding of the reports, and still some man who has possibly in the aggregate since 1870 paid ten cents in taxes toward the State expense connected with this work, claims a copy each year worth two dollars, and is unwilling to contribute a cent toward the making of the volumes. All I can say is, I believe the State society is doing a noble and satisfactory work in organizing branch societies and placing the distribution of the annual volumes in their hands very largely.

A number of others spoke in the same vein as Mr. LeValley.

The next topic upon the programme was discussed by Mr. Clarence M. Weed, a Senior at the State Agricultural College, in the following admirable essay:

INJURIOUS INSECTS NEW IN MICHIGAN.

The past year has been rather a peculiar one in regard to the abundance of injurious insects. That worst pest of the orchard, the codling moth, has been very destructive, so much so that the fruit of many orchards has amounted to nothing. The leaf-rollers have also done very much damage, while the tent-caterpillar has not been at all prevalent. The reason that this last named insect did so little harm was on account of the weather. During the latter part of last spring there were some warm, pleasant days, followed by some very cold ones. During the warm weather the buds burst, the leaves began to unfold, and the eggs of the tent-caterpillar hatched. In the subsequent cold the leaves were checked and many of the young caterpillars perished from the combined effects of cold and starvation. The plum curculio is another insect that has been less destructive than usual during the past year. I know of no reason for this scarcity, unless it be due to the abundance of parasites.

During the past season three little beetles have thrust themselves before the public in such a warning manner that it behooves us to be on our guard against a general invasion. In Detroit one of these species was introduced into a gentleman's residence, thrusting itself in swarms into all the rooms. As usual, application was made for relief supplies, to the genial commander of the forces against our insect enemies, Prof. Cook. With his usual alacrity he was soon on the battle field, directing the artillery full upon the swarms of invaders, and warning the people of our beautiful State of their approach, by a letter published in the Detroit Post and Tribune. Examination showed that they came from the barn, which was connected with the house, nothing but a wall separating the two. In another of our large cities the other two species of these beetles appeared in the mills, doing much damage to grain and flour.

These little beetles are members of the same family, Atamaridae. The species that appeared in Detroit was the grain sylvanus (Sylvanus surinamensis). The beetles of this species are of a chestnut brown color, one-eighth of an inch in length, and have on the edge of the thorax irregular, pointed projections. They are so flat that one of them could easily crawl through a crack one-thirtieth of an inch in width. From this fact we can readily perceive how they can enter a building through closed doors and windows, since the cracks in doors and windows are usually one-sixteenth of an inch wide. The eggs are laid on grain; the larvae as soon as hatched eat into the kernels. In this insect, as is almost universally the rule, the mischief is done in the larval state. The number of eggs which a single pair will produce is not known, but is probably very great. A single pair of an allied insect, the grain curculio, is known to produce over six thousand descendants in a year. The grain sylvanus is a very general feeder. Besides wheat, it infests oats, corn, apple, and other fruit seeds, tobacco, sugar, tea, coffee, meal, flour, raisins, figs, and dried fruits of almost every kind. Hence it is liable to be introduced in purchasing any of these articles.

The next of these little pests may be called the grain paloris (Paloris depressus). It is one of the species that appeared in the mills above mentioned. These little coleopterons are nearly three-sixteenths of an inch long and much broader in proportion than the grain sylvanus. They are of a more reddish brown color, and the antennæ are proportionately shorter. The larvæ are white with brown heads, and its habits are much the same as the preceding species.

The third and last to be described of these insects also works in grain. It is the grain læmophlæus (Læmophlæus alternarns). It is a very little smaller than the grain sylvanus and of a lighter color. The antennæ are nearly as long as the body. The habits of this species do not differ materially from the others.

REMEDIES.

As a remedy for an allied insect, the grain curculio, Harris gives kiln-drying wheat, and says that wheat that is kept cool, well ventilated, and frequently moved is not attacked by it. According to Curtiss, wheat heated to 180° Fahr. will kill the grain curculio and "fleeces of wool laid on the grain will attract and kill the insects." Without doubt the above remedies would prove equally effective for the insects just described.

Unfortunately we can expect no help from that insecticide which has done so much in the last few years in destroying our insect foes, pyrethrum. Larvæ of the grain sylvanus entombed in it over a week were still alive.

Prof. Cook suggested as a remedy, papers covered on one side either with grease or fine-cut meats. Only one of the species, however, the grain sylvanus, can be attracted by this method. The beetles gather on the paper and may then be either scalded or cremated. A Detroit gentleman who tried this collected over a gill at a single trial.

But the remedy from which the best results can be obtained, where it can be used is bisulphide of carbon. The vapor of this liquid is poisonous to animals of all kinds, and from it the agriculturist of the future may expect much benefit in fighting his insect foes. Already it is successfully used to destroy the cabbage maggots, the squash borers, the grape phylloxera and many other of our worst insect enemies. But in using it in and around buildings, great caution is required for it is very explosive. Unless fire in every form can be kept away from it, its use must not be thought of. But if sufficient caution be used there is no reason why it should not be employed, since it is probably the only practicable method of wholly exterminating these little pests. If they are in a room, the doors and windows should be closed on the morning of a windy day. Then a person should sprinkle some of the liquid in different parts of the room and retire as quickly as possible, for if inhaled the vapor is poisonous. The room should remain closed for five or six hours so that the vapor may penetrate every crack and crevice, vanquishing any unseen foe that may be lurking in them. For wheat in bins a long gas-pipe having the holes closed by a broom handle, should be thrust down through the wheat, the broom handle withdrawn and a few table-spoonfuls of the liquid poured in. This will spread over the floor, vaporize and penetrate the grain, dealing death to all the little pests so snugly ensconced in their kernal homes. If the rooms in which the bins are cannot be closed tightly, blankets may be thrown over the grain. Instead of a broom handle, a cloth tied over the lower end of the pipe would probably be as good, and much more convenient. After leaving for five or six hours the room should be opened and the wind allowed to expel the poisonous fumes. There should be no odor perceptible before a fire is brought in the vicinity.

In cold winter weather I made some experiments to determine whether these insects could be killed by bisulphide of carbon, when in a torpid state. From the results of these experiments I concluded that more of the liquid must be used and a longer time given in winter than in summer.

Last summer a gentleman residing at Galesburg sent to the Agricultural College some specimens of a large fly, accompanied with the statement that they were catching and killing cabbage butterflies. They proved to be a species of asilus and correspond to Riley's description of the Missouri bee-killer (Asilus Missouriensis), although the insect has, so far as I can learn, never before been known to inhabit Michigan.

This predacious fly was first described by Prof. Riley in his second Missouri report. It is a common insect in that State, and much addicted to the pernicious habits of killing and sucking the juices of the honey bee. It is a near relative of the Nebraska bee-killer (Promachus bastardii) and of the robber-fly (Promachus Philadelphus). All of these flies in the imago state are carnivorous, living on the juices of other insects.

The imago of the Missouri bee-killer is one and three-tenths inches long, and expands a little over one and three-fourths inches. On the front of the head there is a moustache of straw colored hairs. The eyes are large and almost black. The thorax is slightly pubescent, yellowish and large for the muscles of the wings and legs, which are very strong. The wings are nearly transparent, although slightly brown, especially about the veins. The third longitudinal vein is forked, a characteristic which distinguishes the genus from promachus, in which it is the second longitudinal vein that is forked. The legs are large and strong. They are covered laterally by yellowish hairs and on the upper and lower edges there are black spines. The abdomen is long and tapering, the last segment being of a pinkish color.

But little is known of the earlier stages of this insect. The larvæ of those species of that family that are known are vegetable feeders. The larvæ of a very similar insect, the robber fly (Promachus Philadelphus), eats grass roots, and it is probable that the larvæ of the Missouri bee-killer has the same habit.

If this insect should continue in the good work of destroying the rape butterfly, it may be able to balance the heavy debit marks which the bee-keeper has against it by an equally long credit mark given it by the lover of the succulent cabbage. It certainly is a matter well worthy of observation by every horticulturist, and if the coming summer proves that the Missouri bee-killer does not become "weary in well doing," but continues to destroy the enemy of the horticulturist, we can thankfully place it on our list of beneficial insects, and not, as heretofore, class it among our enemies.

While speaking of the enemies of the imported cabbage butterfly, it may be well to state that during the past season there has been found on a caterpillar of this butterfly some ichneumon cocoons, to all outward appearance the same as those so often found on the larvæ of the grape sphinx (Darapsa Myron). They will probably prove to be the cocoons of a little four winged macrogaster fly. Thus, as the years roll on, nature gives us new helps in fighting our insect foes.

There is another insect, which, though not new in our State, has, so far as I know, never been treated of in any of the reports of this society. It is the white marked tussock moth (Orgyia leucostigma, Sm. and Abbott). This beautiful caterpillar is no new enemy to the American pomologist. Dr. Harris speaks of it as almost stripping the orchards of Massachusetts in 1828, and also as being very destructive to the shade trees of Boston in the years 1848, '49 and '50. Prof. Riley describes it in his first report of 1868 as affecting the orchards of Missouri.

Probably most persons present have noticed in the fall and winter little bunches of curled brown leaves on the trunks and larger branches of the apple tree. If these are examined the most of them will be found to consist of an empty cocoon, covered with many little spherical cream colored eggs. Over and connecting these there is a dry, frothy mass, resembling somewhat the beaten white of a hen's egg. In one of these egg masses of average size, I counted two hundred and sixty-three eggs, so that as will be readily seen, these insects would increase very fast if there were nothing to check their progress. The eggs hatched from the 15th of May to the 15th of June, and the young caterpillars immediately commence their work of spoliation. They are of a whitish color when hatched, but become brighter colored as they grow older. When full grown they have a yellow body covered with yellow hairs. The head and part of the posterior extremity are of a bright scarlet. Just behind the head and near the other end there are too long black pencils or tufts of very fine hairs. The male caterpillar reaches its full development in three and a half weeks, when it is three-fourths of an inch long. The female requires about a week longer for development, and measures one and one-half inches. When ready to pupate the caterpillar seeks some convenient place on the trees, as a projecting piece of bark or a crotch, and spins a thin, whitish cocoon. It soon pupates and in two weeks the imagos come. In this stage the sexes are very different. The wings and thorax of the male are brown, the abdomen bluish. The antennæ are feathered and the front legs thickly clothed with scales. On the inner edge of each front wing there is a small light colored spot. The female is wingless, the body of a dark brown color with lighter colored legs. On bursting the pupa skin she crawls upon the top of the cocoon, is met by the male, deposits her eggs and dies. There are probably two broods in a season in this State, as I have found the female depositing her eggs as late as the 10th of October.

From the description of the nature and habits of the white marked tussock moth, we see that if left to its own resources it would, like the canker-worm, be distributed over the country only as fast as it could travel in the larval state, which would be very slow. It feeds on almost all kinds of trees, but according to Riley seems to prefer the apple, the plum, the rose, and the pear.

Fortunately for the lovers of fruit and shade, this insect is beset by nine species of parasites, so that nature bears the brunt of the battle for us. But because of this, no true pomologist will think of neglecting his share in the struggle. The cocoons should be gathered in the winter and destroyed, but as Prof. Riley well says, "none but those which have the egg-masses on them should be taken, as all of the others either contain the empty male chrysales or else some friendly parasite." The method by which this insect is transported from one part of the country to another is probably as eggs on young trees. Therefore all such trees should be thoroughly searched before transplanting. The young caterpillar when jarred falls toward the ground, suspending itself by a thread. In this way they could be easily swept off by a long pole and burned. Where Paris green is used for the canker-worm and codling moth, these insects will be destroyed at the same time.

A rambling discussion took place after the reading of the paper, in which some points in the paper were taken up and explanations made by Mr. Weed, in which he referred to a display of insects which he had brought for illustration.

Mr. Allis, of Adrian, confirmed many of the observations of Mr. Weed in his own recent experience.

Several members spoke of the desirability of having a State entomologist in Michigan.

Mr. Crozier stated that Mr. Childs of Ypsilanti had recently died, and inasmuch as he had been a member of this society for years, he thought it would be well to record some recognition of the fact in the proceedings of this meeting. On motion the matter was referred to the committee on resolutions, with instructions to report a suitable resolution.

Mr. Dempsey, of Trenton, Canada, gave a very pleasant account of the management of the Ontario Fruit-Growers' Association. Two features are worth recording here. First, a regular monthly periodical is published under the auspices of the society, and second, a free distribution of new plants and seeds is made annually to the membership. These plants are being grown at the direct expense of the government. The government aid is quite ample to place the association upon a good financial footing, and its membership is between one and two thousand annually.

Mr. J. C. Sterling, Secretary of the State Agricultural Society, spoke of the admirable work accomplished by our State Horticultural Society since it started out. He had not been identified with its progress save indirectly, but his father and brother had always been greatly interested in everything undertaken by the society. The most pleasant relationship existed between this society and the association of which he was Secretary. They had always worked together in harmony and he hoped they always would,—at least he saw no reason for any estrangement.

Afternoon Session.

Mr. Abbott, of Lapeer, called the meeting to order, and the first subject announced was

HISTORY OF THE POTATO,—ITS CULTURE AND VARIETIES.

Prof. James Satterlee of the Agricultural College led the discussion as follows:

The potato is now the most widely cultivated and most valuable of all esculent tubers. Its spread and increasing importance for the last hundred years has been wonderful. It is a native of America, probably of both the northern and southern continents. It was described by Gerard in his "Herball," an English work published in 1598, under the name of Potata Virginiana. The name given by Linnæus, however, Solanum tubersum, is the one now used by botanists. It is the most important member of the natural order Solonacea, which includes many valuable plants used and misused by man. It is growing to be a necessity throughout the temperate zone of both hemispheres. It is the poor man's friend, the rich man's necessity. It has found its way into the bill of fare of all civilized nations, and is second only to bread in scores of millions of households. The common name was probably corrupted from the native American name of papas by the Spaniards, who called it bottatas, which was softened by the Portuguese to batatas, and by the English to potato.

It is a native of the elevated tropical valleys of Peru, Chili and Mexico, although Humboldt failed to find it growing in Peru in his explorations there. Prof. J. B. Steere, of our State University, found two or three wild varieties growing near the upper Amazon in his recent visit to South America. He sent specimens to Harvard university and other places for trial. Professor Lemmon, of the California academy of science, found during the past summer in Southern Arizona two or three varieties of indigenous potatoes. They were growing there in the mountain meadows, where the surrounding peaks were ten thousand feet in height. They grow abundantly as large as walnuts. I have here some specimens grown by Professor Beal in the wild garden at the Agricultural College. They were obtained by him from Harvard university.

The potato was introduced into Great Britain by Sir John Hawkins in 1565, although the introduction is commonly accredited to Sir Walter Raleigh in 1586. It was probably introduced into Virginia by the early Spanish explorers from Florida, and into Florida from northern Mexico, Arizona, or perhaps as far east as the highlands of Texas.

They became known in the south of Europe and in Ireland sometime before being introduced into Great Britain. Houghton, one of the early English agricultural writers speaks of its spreading "the whole country over," from Lancashire, where a boat was wrecked, near the end of the 17th century. He speaks of their great productiveness and says they are excellent eaten with butter and sugar. He also referred to a more valuable variety imported from Spain and selling at 6d per pound. It was introduced into New England from Ireland, but was not much improved at the end of the 18th century. In 1771 only two varieties are mentioned, a white and a red, by the most important English work on gardening, and were there spoken of as good food for swine and cattle.

There has been a constant improvement, however, in the number of valuable varieties for the last fifty years. The value of the crop is constantly increasing. They yield best in the extreme Northern States and in Canada. The entire yield of the United States is probably in the neighborhood of one hundred and seventy-five millions of bushels. The yield in this State for 1880 was 8,385,787 bushels, and for the present year the crop is estimated at one-fourth larger, making upwards of ten millions of bushels. No better potatoes are grown than those of Michigan. Those especially of the northern part of the State and of the Upper Peninsula can not be excelled for quality. The fine harbors of that part of the State and the ready water communication with Chicago, Detroit, and other lake ports, give a ready outlet to the crop to good and permanent markets. The experience of the farmers of Michigan for the past ten years has proved that it pays to raise potatoes, and it may be worth our while to follow the subject of cultivation and varieties for a few minutes. First, what variety shall we select? A large number that are excellent are in use, among the most prominent of which are the early and late Rose. One of the most successful potato growers I know has used the early Rose for the past seven years. He plants about the first of June, and thus escapes the first crop of beetles. He uses small potatoes for seed, plants them in rows three feet apart each way, a single potato in each hill. He works thoroughly at first with double shovel cultivator, and finally with wing shovel plow until they are fully in blossom, after which he does not touch them until time to dig. Instead of deteriorating, as one would naturally infer from the use of small potatoes for seed, they have improved both in yield and quality.

For myself, I prefer the late rose, planted the same distance apart as above. It is a strong grower, enabling it to withstand the attacks of insects, and it outyields the early Rose. It brings as high a price in market, although inferior to the early Rose in quality. I plant medium sized potatoes cut in two or three pieces, one piece in each hill. After the ground is marked both ways I cut the places for the potatoes as deep as possible with the hoe, drop and cover about four or five inches deep. Both varieties of the Rose potatoes have the good habit of crowding their tubers close together in the hill and above the seed potato. The double shovel cultivator and the wing shovel plow throws sufficient earth around the vines to keep the tubers nicely covered as they grow. The surface is also kept constantly mellow and open—a most essential condition for the successful growth of potatoes. A good, rich, sandy soil is also essential for the best success. An old sod plowed in autumn, especially a clover sod, is considered a good preparation for the crop. Well rotted stable manure may be used successfully as a fertilizer, but unfermented manure never. The potatoes are almost certain to grow scabby and watery. Plaster, ashes, and bone fertilizers containing potash are most valuable. In dry seasons planting shallow and covering the entire surface with straw four or six inches thick has proved very successsul, but this is too much work both in planting and digging to be profitable for large field culture. The effects of drouth may be better overcome by constant and thorough cultivation, making a mulch of soft, porous earth over the surface.

There are many devices in use for digging. An implement something like a shovel plow, with prongs running backward from the blade, which sifts the earth from the potatoes, and is drawn by one horse, works well and is cheap. There are other and more ponderous horse machines that are said to work well when the ground is free from stones and stumps. For common use I prefer a fork made on purpose, with six or eight tines a little longer and a little more curved than those of a common manure fork. A common sixtined manure fork will answer every purpose. One man will dig as fast as another can pick up, and they are not bruised or cut in any way. For storing potatoes temporarily pits may be prepared in the field holding forty or fifty bushels, covered first with a layer of straw and then with a thin layer of earth, with a length of tile on each side and at the top of the pit for ventilation. If we desire these pits to remain over winter they may be rendered safe from frost by covering with a layer of four or five inches of horse manure or straw, and over all about six or seven inches of earth. The last covering should be delayed as late as the weather will permit. For winter storage I prefer putting them in cellars if we have room. They should never be stored in any great quantity, however, in the cellars of our houses, as the vapors passing off in the sweating process which takes place, are offensive and probably poisonous.

If there is a ready sale for them at the time of digging it will generally be best to draw from the field directly to market. Forty cents per bushel will pay better than putting them in pits or in the cellar and taking them out again the same season for fifty cents, and as good as sixty or sixty-five cents in the spring following, as there is a certain amount of shrinkage in weight and more or less risk of loss from freezing or other causes.

Among the many varieties in common use during the last twenty-five years the Peachblow for a long time took the preference. It was free from rot, of the very best quality, productive, and a long keeper. The tubers grow far apart in the hill and it takes the entire season to mature. Since the Colorado beetle made its appearance at the east the Peachblow has fallen gradually into disfavor, as it fails to ripen thoroughly. The past season it has done well, however, and for quality I think it has not been equaled by any of the new varieties. Among the more recent varieties introduced, the Burbanks Seedling is quite prominent. It is a smooth, long, white potato, rather late, and not sufficiently dry and mealy to be popular at the west. It yields well and sells well at the east. The Early Ohio and Early Vermont are both of excellent quality, as is also the Snowflake when at its best. The Beauty of Hebron bids fair to become very popular. Its quality is excellent. It is very early but grows soft in spring sooner than it should for a first-class market potato. Bliss Early Triumph is a beautiful very early potato. A few in the garden will not be out of place. The White Elephant and Mammoth Pearl are promising new varieties. The White Star is said to surpass all others in all desirable qualities; I have had no experience with it. Time will tell whether these or some other will take the place of the older favorites. A prominent fault with some of the newer varieties is their lack of quality. I prefer something more than dry starch. For eating in autumn I prefer the Beauty of Hebron, Early Vermont, Snowflake, or Early Ohio, either baked or boiled with the skins on; for winter and spring the Peachblow, either boiled or baked, and for mashing at any time of the year the old favorite of twenty-five years ago the flesh colored. It is fine grained and smooth and the flesh of a rich golden yellow. But I have no need further to weary you with a description of varieties. They are too numerous to describe. Dr. Hexamer, of New York, a high authority on potato culture, keeps constantly on hand as a means of comparison upwards of 300 varieties, and it is an easy matter to originate others, for a single seed ball may produce a score or more.

The subject of potato culture is an interesting one, and one which every farmer is prepared to discuss. I do not think I have added anything to the sum total of knowledge upon the subject, but if I have opened the door for a profitable discussion I shall be more than satisfied. It is easy to estimate the cost of production and the profits at a certain price. The sooner the people of Michigan realize that the soil and climate of our beloved State and especially of the northern part of it, is exactly adapted to successful potato culture the sooner they will enter upon an era of increased prosperity. Plant the standard market varieties, on good soil, using good, natural tubers for seed; keep the surface well stirred and clean, and success is almost absolutely certain.

Dr. Fuller, Eaton Rapids: I have found that potatoes for seed cut to single eyes very early in the spring and placed on dry sand in the sun would sprout rapidly; and in a few days plants two inches in length, with a good root system started, could be taken off and planted out in boxes as tomatoes are often transplanted before planting out in open ground. In the meantime, while these plants were growing, another set of sprouts from the same eyes would develop, and after removing these, the pieces of potato could be planted in open ground and most of the eyes would grow and produce a good crop of tubers. I consider this quite an important factor in potato culture when one sends off and procures a new variety at a dollar or more per pound.

Secretary Garfield: What is flavor in potatoes?

Prof. Satterlee: The same as flavor in other things—that which gives a special character that is recognized by the sense of taste.

President Lyon: Does flavor result from character of soil?

Prof. Satterlee: It varies with differences in soil; the same variety will have a varied flavor planted upon different kinds of land.

E. H. Scott: What do I understand is your view of the sweating of potatoes?

Prof. Satterlee: The tubers will sweat for from three to five weeks from the time of digging; sweet potatoes will sweat every time they are moved.

President Lyon: An expression in the essay leads me to enquire for a definition of the term fruit.

Prof. Satterlee: I don't know what the experts would reply, but I should recognize as a fruit, a product of a plant which contains the seeds within or attached to an edible pulp. This is not the botanical definition, but one that accords with the popular notion of the term.

Mr. Allis: I would not define but illustrate my idea of a definition. The potato tuber is a thickened root; the potato ball is the fruit. The latter contains the seeds in a pulp, but it is not considered edible.

Pres. Lyon: Why do varieties of potatoes deteriorate? We have altogether a different class of popular potatoes each decade. Twenty-five years ago the Mercer was our most popular potato. We never see it now.

Prof. Satterlee: I suppose disease, insects, poor seed, taste, and fashion, all have to do with the change in popular varieties.

Mr. Healy: Deterioration is our own fault; by giving proper attention to the propagation and cultivation of any given variety, it will grow better instead of worse in the hands of the grower. I have a neighbor that has been steadily improving the Late Rose by selection according to a type, and giving good culture.

Mr. Scott: I suppose you would not plant small potatoes if you desired the variety should improve.

Mr. Healy: I am not so particular about that as that the seed should be chosen from the best type of a hill; that is, I would consider the habit of the whole plant, and select tubers either large or small from the best plants.

Mr. Rosenkrans: My father raised a great many potatoes, and always selected his seed from types that suited him at the time of harvesting the crop.

Varieties never "ran out" with him. I have followed the plan quite successfully myself.

Mr. Dempsey: Varieties of potatoes are multiplying with the years until "their name is legion." The most common method of producing new sorts is by planting the seed found in the fruit or "balls;" but this is not always the case. New varieties may be originated by the selection of tubers or parts of tubers that show some marked distinction. We understand that Mr. Charles Arnold, of Paris, Canada, has brought out a new and valuable sort from selecting a single eye that showed peculiarities, taken from a tuber of some common variety. This will not seem strange when we remember that often times the most delicately beautiful varieties of geraniums, fuchsias, and the like, are propagated from sprouts in plants of common sorts.

Mr. Stowell advocated very careful selection of seed from the very best of the crop; change of seed occasionally from another place; a rotation of crops so that the soil will not become exhausted of the elements that grow good potatoes.

Mr. Partridge: I think potatoes are apt to deteriorate through the excessive use of poisons in fighting the potato beetle.

Mr. LeValley: We want a healthy stalk, and in-as-much as the potato is an enlargement of the stalk, I would look very carefully to the potato tops in selecting my seed. One point I would like to make concerning testing the quality of potatoes; you cannot get the highest excellence in a boiled potato. To test quality, you must bake the tuber.

Mr. Allis: I would like to inquire if there is any truth in the statement sometimes made, that the green part of a potato is poisonous?

Prof. Satterlee: Dr. Gray says there is a poisonous principle in the potato, as in other members of the order of plants to which it belongs; this poison is rapidly developed when potatoes are exposed to sunlight, and is dissipated by boiling. The water that potatoes are boiled in, is poisonous to some extent.

Mr. Allis: The Boston Journal of Chemistry states that the poisonous principle is developed in the inner part of the skin of the potato.

Mr. Leland: In my experience, I have come to the conclusion that the Early Rose variety makes better potatoes, if planted late.

The hour having arrived for the calling of the next topic, the Secretary read the following paper, prepared and forwarded by Judge Geo. W. Lawton, of Van Buren county, on

FORESTRY AND ORNAMENTAL PLANTING.

It seems to me, those who have given attention to the matter in hand do not fail to see that, the inordinate rage for wealth among men in civilized countries involves the forests and their destruction.

It also seems to me that the course of the friends of forestry lies in the way of the forest ravager, to point him out as a public enemy; in that he is broadening the road to ruin, if not immediately for himself certainly for his fellows; and he should be brought to surrender his immoderate and indiscriminate zeal for "more trees to slaughter," and taught a judicious respect for the laws and agencies of nature in the vegetable world, and a lively horror for the irretrievable disasters that crowd so hard upon his work.

I know the tree slayer will resent these charges, for he prides himself upon his skill to turn forests into money, and conceives himself to be a public benefactor, a reducer of woodlands into plow-fields, and a pioneer of the rose, that will make the wilderness redolent; but he masquerades under one of the colors of the horticultural cloak, and that for personal gain only. I would strip it off from him.

I never fully felt the force of Drayton's protest and imprecation, written in the sixteenth century. upon the unreasoning destruction of forests then going on in Europe, that left upon that continent its legacy of barrenness and stunted vegetation, not yet exhausted, indeed, inexhaustible, as when, last spring, I stepped from the cars at Dunningville and saw north, east, and west, the trunks of trees gaunt and lifeless, standing countless for numbers as far as the eye could reach—the desolation of the axe and fire. Instantly the words blazed up in memory:

"Our trees so hacked above the ground,
That where their lofty tops the neighboring countries crowned,
Their trunks like aged-folks now bare and naked stand,
As for revenge to heaven each held a withered hand."

Indeed, who divines but the poet, thought I, and turning, found what justly belonged there—a miserable, poverty-struck station-house and denizen. One pleasant feature only met my eye—a little barefooted girl, deeply browned by wind and sun, offering bunches of wintergreens, laden with their bright red berries—nature's delicacy in want—for sale. I ventured to ask the proprietor of a country wagon, among other things, whether the soil beyond the "barrens" held its moisture well. "No," he answered, "not as well as it used to—the springs and cat-holes are drying out." "Perhaps you can make your gardens in them," suggested a quizzing runner standing near us. "Y-e-s," said the farmer slowly, "if the knobs don't blow into 'em." The scalping power of the west wind over sodless, sun-burnt sand knolls was doubtless known experientially to him and he answered accordingly.

One of the most comprehensive generalizations made by Gen. Grant of his observations upon his journey around the world is, that the soil of the old world is worn out; and its poverty is driving the inhabitants to the new, for food, and the realistic descriptions given by travelers of the appalling poverty prevailing in the treeless tracts found everywhere in the old world show good warrant for the increasing exodus. Would that the "withered hand" should not follow them!

The commercial reports of the Atlantic and Pacific coasts give the price of American timber in the markets of Asia and Europe, and daily record the rate at which the old world is absorbing what its costly experience should teach us to guard. Salutary laws are needed to control the matter and prevent cruel waste; laws that will allow the cutting of timber providently and restrain all improvidence. This is a national matter before us, only because we are affected by the general welfare of the nation.

In a more restricted way the horticulturists of Michigan shall throw their influence in favor of forestry laws, applicable to ourselves. Laws of such purport no doubt will find sanction in the general police law that underlies and preserves society, and is always invoked in presence of immediate and threatened danger. "Salus populi suprema lex, est."

Indeed it is the first duty of the citizen to see that the community gets no harm from individual and fragmentary action; or, as Cicero said on a memorable occasion, "Videret, ne quid res publica detrimenti caperet." This accords with most men's sentiments, and I find most horticulturists are in favor of preserving a piece of wood-land on their neighbor's land.

I confess I have little hope of effective action in this matter on the part of my brothers. They are too conservative. The average horticulturist has too strong a grip, as yet, upon the animal side of this business, to let up on his aversion to untillable land. "I set out trees," said one to me with indignation in his tone; "Haven't I been all my life cutting them down? And shall I set them out again? Not if the court knows herself, an' I bet she does." However, the horticulturist hungers for facts, as his stomach hungers for food. The trouble is, if the fact presented to him does not accord with his own experience, he is as likely to reject it as his stomach is to kick at an unaccustomed filling.

I know of an instance occurring within the last two years, where a man who has a peach orchard and some grape vines, cut down a beautiful line of second growth hickory and oak along the highway, because, he said, "The trees kept his old rail fence moist and rotted it." He didn't see until the wind break was gone that it helped to keep the interior of his field moist also.

Another man lately cut down a similar line of oak and hickory, on the south line of his vineyard, "To let in the air," he said. At present he has plenty of air, and his vines crowd to the earth to escape it. On this latter farm was a fine peach orchard, sheltered on the southwest and west by a voluntary of oak and black walnut. There were grapes in the line which the owner did not care to kill. A few winters ago a southwest storm of unusual severity struck that orchard, and, in the line of the grapes, the trees were destroyed, and in the line of the oaks and walnuts, the trees suffered only in their buds, the fruit as a crop being killed. It was after this experience that the man cut down the trees on the north of his grapes. The discouragement is, that each of these men could take their seats in the sessions of the society and be accepted as intelligent members; for they are really intelligent men and well-to-do in the world—makers of their own property.

There are three brawny oaks scattered on a field of mine, near the highway. I bought the land in the "grub" or it is safe to say they would not be there. They are gnarled and crooked, with great arms reaching many feet from their short, thick trunks—really picturesque objects. I suppose the tree slayer was greatly put out at the sight of these trees. No salable timber could be got out of them, only some posts or a lot of rails. All else stove wood—at that time of not much account, but of some value now. Well, people ask me, "Why don't you cut them down?" "For want of a sufficient reason," I reply. "But they will make a pile of posts and rails," they urge. "I know it," I reply, "but I can buy those, and I would have to wait for not less than three hundred years to replace the trees." I can compliment the intelligence of my interrogators generally by saying that I rarely have to defend my stalwart friends beyond that point.

As a society I respectfully suggest that we should accumulate facts relating to forestry. What is the proper proportion of cleared land to woodland? And how to be distributed? What are the best forest trees for planting, considering the time of growth to maturity and their value for wood and timber? Should edible nut-bearing trees be favored. What facts have we touching the drying of the surface of the earth by the wind and the influence of trees in preventing it? What means have we of verifying the facts that none may err therein or remain doubting Thomases? I earnestly urge special effort in this direction for the better information of the brethren.

The semi-god Æneas, in his wandering, seeking his distant home on the vine-clad banks of the Tiber, was shipwrecked and landed on a strange coast. Foodless, he wandered inland and saw moving into a valley a herd of deer, apparently marshaled by some bearing lofty heads and branching antlers. A long line of others stretched behind these into the dark shadows of a densely leaved forest. The horticulturists of Michigan have noble men in the van delighting themselves with the lawns, the gardens, orchards, and vineyards, all beautiful to behold, and very profitable to their owners, while the main column is scattered far to the rear among profitless orchards and dolorous vineyards, tentative efforts of the owners to rise among "fruit men," until it is lost in thickets of wild apple briar bushes, and fallows overrun with the tangling dewberry. I long for the time, which however I do not expect to see, when at the command, "left front into line," the whole force thoroughly informed, will take the position ordered, each man as completely equipped as his fellow. For with such an army, our next best friend, the forest tree, will be safely delivered from its ruthless enemies.

As to ornamental forestry, I must say it is so exclusively a matter of taste in the individual, that I am loth to express my own views, lest all the ladies and gentlemen present shall say I am wanting in that they each possess in a very high degree. But assuming that all animals, from the mysterious behemoth that "the lotus leaves covered with their shade and the willows of the brook twined about," down to the highly cultured horticulturist, who loveth to sit beneath his vine and peach tree, delight in the protection of trees from sun and wind, I will venture to repeat the truism "that it is indeed practicable to so dispose trees about the home and fields as to secure the benefit of their shelter and display their natural beauty." The location has much to do with the arrangement. There are beautiful lawns slightly shaded; there are still more beautiful densely shaded rolling grounds, water-sides, hill-sides, and mountain slopes—all are beautiful when covered with trees, even when in dense masses. A bald hill is no more beautiful than a bald horticulturist. Then the disposition of trees,—long lanes bordered with them. Weary and crotchety people insist that the trees keep the road damp and give them rheumatism. Groves set out like chess-boards are so many lanes, and even the regular line of orcharding may be broken up with gain in beauty and no appreciable loss in utility. The natural disposition of trees in the forest is rarely imitated in art, but when done the beauty gained is only rivaled by nature's own planting. In all cases the varieties in the main must be preserved. Only healthy trees,—those that hold their health summer and winter,—are beautiful. Foreign varieties are curious to the eye, and perhaps beautiful if healthy, otherwise they do not harmonize with the place. A foreigner away from friends and out of health is an object of pity, not of beauty. Nature, rather than art, gives beautiful forms to trees as well as to other of her creations. Those varieties that submit to marvelous trimming into shapes indescribable, show they are the subjects of very ingenious masters to the loss of their natural beauty. All the lines of beauty are in nature. A regard for variety in foliage should be had. The hues of trees are as much the joy of autumn as flowers are of spring. A grove wholly of maple, a line entirely of elms, a large body of oaks, produce an irritable sameness that can without loss in value be broken up. Parks are beautiful when they are enjoyed and people can walk in them; but a grave-yard care of parks robs them of their beauty. No one would tread on graves,—if he would he should be warned, perhaps fenced off; so with a garden or flower-bed. But the shade of a tree should be enjoyed wherever it falls. School grounds should be ornamented with trees, varied and grouped so as to give the desired shelter and display all their natural beauty, but the pupils should not be fenced off; when enlivened by merry, boisterous children, these grounds are most beautiful. Fort street, Detroit, is a beautiful avenue, and widely celebrated as such, but Woodward avenue below the campus is, when thronged with people, scarcely less beautiful.

In laying out grounds, no one, I apprehend, will adopt the cut and lithographed plans of the professional landscape artist, unless he is helpless as an unfortunate in a ward, for the inclination always is to inject some little originality into the work, which, even if it is rough, may have some charm of beauty about it.

Mr. Stowell: One of the pleasant things I note in visiting New England is the progress making there, in forest planting; places that were bare in my boyhood are covered now with trees, and the appearances that always go along with the forest are beginning to show themselves in these young plantations of trees. The wild flowers and plants, and the birds of the forest are now coming into localities that had been stripped of every vestige of forest growth when I was a boy, and since planted to forest trees.

Mr. Pierson commented upon the effects of trees in the streets of Flint.

Mr. Gott advocated the planting of nut-bearing trees along the highways, in the fence corners, and in groves about the homes. People will take more interest in tree-planting when it can be made clear to them that the dollar is on that side of the tree question. We are fast nearing a point in our State history when it can be shown plainly that the money is in planting trees rather than cutting them down.

Prof. Baur: In Germany, forests are protected by law; forestry is an art that is practiced upon the best principles of science, and foresters are selected from men of great cultnre. They are graduates of the universities.

Mr. Healy: I take a great interest in ornamental tree planting. There is a great deal of pleasure connected with bringing about the farm, trees of widely different types, and arranging them for best effects.

Next in order in the scheme of tropics was

LANDSCAPE GARDENING FOR SMALL PLACES.

The following letter was read from Mr. R. Haigh, chairman of the standing committee on landscape gardening:

Gentlemen of the State Horticultural Society:

I am sorry not to be with you, but if I could be present, might say something like the following upon one topic of your convention:

The art of landscape gardening is steadily growing in public favor and receives more attention and consideration from year to year, but is still far behind nearly all other arts and professions. There is still a feeling that on small places especially, there is no opportunity for the use of its principles. In the laying out of parks, cemeteries, and public grounds, it is generally admitted that the skill and knowledge of the artist are needed, but in the small grounds it wont pay. Anybody can fix them. The same idea prevails to some extent in architecture, but happily that is passing off more rapidly. People are beginning to see that it pays pecuniarily as well as pleasurably to secure the skill and taste of the architect. Wherever this has been acted upon, a very marked improvement is seen in the style of buildings and with usually a saving in the cost. The same thing holds true in landscape gardening. Its principles are as applicable to small places as large, just as the principles of architecture are as applicable to the small building as to the stately mansion, or as the principles of painting as well to the smallest piece as the huge masterpiece. It is a profession by itself, requiring long study and considerable natural talent and its full value will only be recognized when the demand is such as to stimulate it to its fullest development.

The objection that the mass of the people cannot afford to employ it, is one that the facts will not sustain for as the architects plans are found to save more than their cost, so the plans of the landscape gardener will be proved a measure of economy besides producing so much more satisfactory results. And the improvement will be more marked in the work on the grounds, for the building is usually done by skilled workmen while the work on the ground is usually done by men who have no knowledge of the principles involved, without skill or experience, and with almost no idea of the fitness of things. The principles and rules of the art can be stated, but there is hardly a rule that might not need some modification to suit existing circumstances, hence it is almost an impossibility to give a rule that would be applicable to all places, and it is just for this reason that such poor results are reached when people attempt to do the work without any plan.

At present there is little stimulus to the acquirement of skill in this direction, but it is to be hoped that those who can afford to aid in this development will do so by a demand for greater skill and taste, and by giving it employment. It will certainly pay in every way. While specific directions cannot be given there are a few general principles that are applicable in all cases, and which if followed will prevent one from going far astray.

The first and most important is a plan. Have a plan, made by a competent artist if you can, if not, make it yourself, but have a plan. No good results were ever accomplished without a plan, in any kind of work. Avoid attempting too much. Simplicity of style should mark all small places. Convenience first, then as much beauty as possible.

A curved walk gives variety and more lasting satisfaction than a straight one but needs more room, and in many cases the straight walk is the best, even for beauty.

A carriage drive should be introduced for use, not for show, and the same may be said of walks. A smooth lawn is much pleasanter than a walk.

A perfectly smooth even thick turf is of the first importance. Nothing satisfactory can be reached without it.

The location of buildings and walks and size of grounds must determine the planting, but large trees should be used sparingly on small lots. The house needs a little support by planting; out-buildings screened from view; corners rounded and smoothed, and the exquisite beauty of sunlight and shadow produced on the lawn.

Avoid all set forms in the planting, and while rare specimens are desirable, the most satisfaction will come from using such varieties as are known to succeed well in the soil and climate in which they are to be used.

I trust I shall not discourage any one from attempting the adornment of their own home. There is no greater source of profit and enjoyment. But we greatly need a development of taste and skill in this branch of art, and the recognition of the fact that it is art. When this shall have become more fully established, then will the capabilities of the art be more fully developed and the beauties of the landscape brought out. And each home shall be "a thing of beauty and a joy forever."

R. HAIGH, JR.

Grand Haven, Dec. 4th, 1882.

President Lyon: We see people making grevious blunders in the planting of their places, and it seems to me that our society can do very little work that will be more telling than by bringing out some good points concerning the proper methods of tastefully arranging trees, shrubs, plants, and flowers, about our smaller homes.

Mr. Crozier: Children become greatly attached to trees, and trees become almost a part of a family—it hurts to have a pet tree cut down. I think it a capital plan to have the different members of a household identified with the planting of trees about the house. It creates associations that are lasting upon the memory, and the influence of these early memories lasts until old age creeps on.

Mr. Lyon: A great deal of taste may be shown in the growing of ornamental screens, and while developing a thing of beauty in growing a hedge or screen, one is not working for appearances only, for in screens there may be a large measure of utility.

Secretary Garfield: The inquiries that come to my office by mail are very largely pomological; but when away from home pursuing the work of the society over the State, a very large proportion of the questions that are put to me are concerned with landscape gardening; especially do people want to know about trees, shrubs, plants, and flowers, for certain purposes. I am satisfied that our local societies will find more to do for Michigan homes in this department than in any other. The questions arising in this field have more to do with all the members of families than those pertaining to any other branch of horticulture. If we ever expect to interest our young people in the work we are pushing, as a society, it must be by giving especial attention to ornamental horticulture. There is really very little practical knowledge of landscape gardening practiced by people who build homes; still, if more attention were given to the principles upon which good taste is based, there would be a great deal more satisfaction in the work of beautifying home premises. I still contend that the work of educating good taste in these matters is a legitimate part of the work of our schools, and if made a part of the curriculum of our common schools, would be a step in progress that would have a far reaching influence.

Mr. Aldrich: I appreciate the remarks of the secretary as to the satisfaction coming from acquiring and employing information in the field of ornamental gardening and tree planting. I have been at work a couple of years developing a new place upon poor soil, and have found it rather up hill work. But with all my failures there has been quiet pleasure in the work—a work, as Mr. Garfield says, that interests the whole family.

Mr. Dempsey spoke of the great work in the use of trees for screens and for ornamental planting that had been done at Montreal on the rocks and mountain sides, under very great difficulties.

Mr. Gott: One of the trees that I wish was planted more for ornament is the tulip tree. I think it the grandest tree of our latitude. It is quite a rapid grower, handsome when young, and majestic in its old age.

Mr. Dempsey spoke of the autumn colors of some maples in his acquaintance that were as handsome as the finest of the coleus family.

Dr. Day spoke highly of the sumac for ornamental planting. Its rich autumn foliage can not be surpassed in beauty by anything in his acquaintance.

Mr. Lyon: I am reminded that even in our exhibits of fruit at the autumn shows there is opportunity for the display of the same training that produces fine yards and beautiful plantations of trees. Rarely have we seen any attempt in this direction. The fruits are displayed without any endeavor to enhance the effect of an exhibit by accessories.

Evening Session.

The exercises of the evening session were so arranged, as to be of great interest to all who attended, both from abroad and home, being music, short speeches, and committee reports, well interspersed.

Prof. Graves, who directed the musical part of the programme, was very successful in his endeavors to furnish pleasing music, and picked from his class for that purpose, Mrs. C. H. Bowker, Mrs. H. C. Van Deusen, Mrs. J. H. Whiting, Mrs. J. C. Willson, Mrs. P. D. Phillips, Miss Bertha Ward, Miss Graves, and Messrs. C. H. Wood, R. E. Morton, Jerome Haver, and Geo. L. Watrous, with Miss Belle Jenney as pianist. The selections rendered by this array of talent were among the most acceptable of the evening's programme, notably the piano solo of Miss Graves. The grand piano used during the evening was loaned for the occasion by Mr. Crawford.

The addresses of the evening were short, pithy, and ofttimes very valuable in instruction. We can give but a summary of most of them.

"A TRUE INDEX OF OUR CIVILIZATION IS FOUND IN OUR HOMES,"

Was the first sentiment announced. O. R. L. Crozier, of Ann Arbor, was called upon to respond, and said substantially:

This sentiment comes very appropriately from our society, the heart of whose care is the home. Probably no one will dispute that the average home is a true index of the State, a fair measure of our civilization. What is a home? Not a place where one man nor one woman lives. As well think of a nation or a world of men alone or women alone. Nor will a man or a woman, married ever so well, do. Add one boy or one girl, or even one of each, yet the type is defective. Not less than six fill it. The boy needs brother and sister companionship, and the girl also needs both sister and brother companship. If the grandmas don't supply the needed quartette, borrow from your neighbors, as one of our members present has done, and finds it to work well. But growing into place, with all the loves and kindness and reciprocal helps it implies, is better than substitution.

Civilization means government and culture; so does home. There must be authority and respect for authority. No need of despotism; that shows want of culture and self-control in the despot. No slavish fear; that is rebellion corked up. Personal and social rights and interests are studied and adjusted. The frictions and satisfactions, the civilities, compromises, stratagems, diplomacies of the broader fields of maturer life can be experienced and learned cheaper in this model. Know your rights and maintain them, but listen to the claims of others; the good of all is better than the good of one. A full home well ordered rubs out selfishness and gives development for the responsibilities of life, the leading thought always being—and it is a safe one—that we live more for others than for ourselves. A generous feeling of kinship pervades the whole establishment, and puts everything, vegetable and animal, rational and irrational, on its best, lauds its ambition, and helps it to succeed. All mine are parts of me. I and they give and take, and so we grow.

Such a family deserves a home, and they will make it and should own it. The soil, the tree, the vine, and domestic animals love the owner's hand. Comfort, content, and thrift will come in the house and around it. The suggestion of divorce would be treason there. The combined vigor of muscle and thought and character, going forth from millions of such homes, has carried our nation forward to its commanding position and holds it foremost in the career of progress.

Would you reform the State? Reform the homes. Let the common talk, reading, habits, manners there be such as you would transplant into all places of influence and power.

The second response was called out by the announcement:

"HORTICULTURE AND THE SUNFLOWER."

Judge Wm. Newton said: Because I am a farmer I suppose I am asked to speak. Horticulture means gardening, and is confined to a limited or small piece of land; it includes the raising of fruits, vegetables, and flowers. It is farming on a small scale, with the opportunity for greater care in the cultivation, and for the trial of those experiments which have resulted in producing better fruits, superior vegetables, and finer and more beautiful flowers. To look at horticulture from a mere material standpoint, the worker is a man who delves in the earth for the purpose only of raising a crop and reaping a profit,—a man who lives to eat, rather than one who eats to live. But this is not the proper estimate of the man whose courage entered the forest, cut down the trees, cleared up the land and planted it with the vine and the rose, and made it more beautiful than he had found it. His position is entirely different; he borrowed his ideal from the world in which he lived. He saw the sun, and felt its warmth and life inspiring rays; he saw the sea and rivers and rivulets, the latter feeding the former, and affording drink to the almost numberless men and living creatures that daily slaked their thirst; he found out that in reality the rivers and streams only gave back to the sea its own offspring, for the sea is the father of the rain; and that nature's strong and mysterious hand had woven sponges in the clouds, which absorbed moisture from the sea; and these sponges, borne by the winds, were carried to his garden or farm, and their contents poured out upon the earth, feeding root and limb and leaf. He gazed upon the arched heavens, studded with millions of brilliant inhabitants; the moon, suspended lamp of the night, and stars whose peaceful brilliancy attracted the soul of the gazer to wondering worship, and the invisible part; the flower of man's life pronounced it all supremely good and grand. This veneering of the heavens was the vesture in which the world was clothed. He bowed his head, and a voice whispering in his ear told him that the grandness of all he had seen was as nothing compared to himself; that he was a man, a sovereign over all he saw, and felt, or touched; that all these wonders were his servants; that all nature waited on him, and at his command would do his bidding; that the heavens, the earth, and sea, the rain, electricity, the air, and all its constituent parts were his servants, waiting and ready to do his bidding; that he had but to ask and do, and nature's voice would utter back his desire; that his life was grand; it was nurtured in the arms of nature; that she gave him life and health and made him the fountain of vigor from which flowed the new pure blood that should replenish the exhausted dwellers of the city. I have no admiration for a farmer, large or small, who has no higher thought of his occupation than that of work. I have no admiration for the farmer's son who leaves the farm to become a sort of city gentleman. As a sovereign, he is in his occupation head and shoulders above all others, his the primal one, his part to create. All other occupations are the results which his necessities, the fruits of his labor, have created. The advance of railroads from the most distant points of civilization to the sea board, and the ships which whiten the seas, are the results of this supreme class of men who demand a rapid and safe transportation for the products which nature's lavish hand has thrown into their granaries. His calling has called into life the inventive genius of the world, and intellect pays homage to his calling.

But this ideal of supreme good also suggests the beautiful. Man loves the beautiful. The robe of the earth above is spangled and sparkles with an infinitude of beauty; the earth clothes herself annually with choicest beauty in natural flowers. How rich a vesture; how beautiful the garment nature's hand has thrown over and around the world! Even the child resting in its mother's arms pays homage to nature in its admiration of the beauty and fragrance which greet them from spring-time until winter binds the earth in chains of ice. It costs but little of money or care to surround home with the choicest flowers; and the gratifying food furnished by their beauty and fragrance is far more than compensation for the effort. The tulip, narcissus, violet, pansy, gladiolus, geranium, and rose are within the reach of all. "Flowers are the alphabet of angels, whereby they write on hills and fields mysterious truths." Another flower celebrated in mythology, even if left alone, uncared for, will grow to majestic stature, and throwing out its laterals will crown itself in glowing beauty from foot to crown. It will lift its face to the rising sun, and in its faithful constancy will give him as he retires to his western bed the same loving look it gave him in the morning—the first and last alike. Mythology tells us that a water nymph named Clytie fell in love with Apollo (the sun); he made her no return; that she sat for days upon the cold ground, her unbound tresses streaming over her shoulders. For days she watched her god and neither tasted food or drink; she wept, and her tears and the chilly dew were her only food; that she gazed on the sun when he rose, and all through the day until his setting, her face was constantly turned to him, and she saw no other object; that at last her limbs rooted to the ground, her face became a flower which turns on its stem so as always to face the sun in its daily course. Poets have made it the subject of their verse. Hood, in his "Flowers," says:

"I will not have the mad Clytie,
  Whose head is turned by the sun.;
The tulip is a courtly queen,
  Whom therefore I will shun.
The cowslip is a country wench;
  The violet is a nun;
But I will woo the dainty rose,
  The queen of every one."

As an emblem of constancy, Moore uses it thus:

> "The heart that has truly loved never forgets,
> But as truly loves on to the close
> As the sunflower turns on her god when he sets
> The same look that she turned when he rose."

We may go back on Oscar Wilde if we will, but as an emblem of constancy may I remind you that we can never, never go back on the sunflower.

At this juncture, Mr. E. F. Guild, who was about to leave on the Saginaw train, said he had craved the attention of the audience long enough to announce a sentiment. He said the Secretary, who was in charge of this evening meeting, had so arranged the programme as to leave himself out, and as every one knew he took a lively interest in little people, and believed in educating them in horticulture; and withall, was so successful in bringing up his own family of little folks to enjoy the beauties of the "art which does mend nature." He desired to announce the sentiment "Horticulture for little folks," and call upon Secretary Garfield to respond.

The Secretary declared if he had not thought the meeting was without "Guild" he should have been very slow to have shown his most vulnerable point. That he was in hearty sympathy with Mr. Crozier's ideal home, made up of "one man, one woman, two boys, and two girls." It was a good model for every one to copy after. He didn't know of a better place to build such homes than Michigan, which suggested the next sentiment,

"MICHIGAN A STATE FOR HOME LOVERS,"

And called upon Thos. W. Palmer, of Detroit, to respond.

Mr. Palmer's address we cannot abstract, and as we have no means of getting the whole of it, it having been an entirely impromptu speech, we will not do him the injustice of even attempting an epitome of it. The Secretary as well as the audience were completely captured by the capital anecdotes, and their application to the topics in hand. He knew of no State where there were so many dear homes, not palaces, but homes of love and peace. The thought of their homes in Michigan was what kept the Michigan soldiers alive in their southern prisons. Let every man's object be to secure a home; no matter how humble, it means to him, if properly employed, a large measure of happiness.

The next subject announced was

HORTICULTURE FOR CHILDREN,

To which our delegate from Ontario, Mr. Gott, responded about as follows:

I am sorry to be called on for an address just at this moment, after listening to such a perfect feast of sound as has been given to us by the orchestra. I am afraid my remarks may appear low in tone and uninteresting to this large and attentive audience. At first, sir, when my subject was named to me, I was greatly pleased, and thought I could easily do something with it, but upon more mature consideration, the aspect is altered, and I find myself thickly beset with formidable difficulties. Although not wishing to think less of my subject and so diminish my ardor, yet I think considerably less of my feeble abilities to do anything like justice to it. I now find it particularly difficult to get down to a childish conception of my subject—excuse me, sir, but I mean a conception of the subject that is adapted to their understandings and lives. In other words, to think as a child, and to speak as a child, which should certainly be the prominent traits of those who would be successful teachers of children. Kind, sympathetic, parental teaching, is undoubtedly the very best that can be applied to children, and that which is most likely to be eminently successful in its influences. Parents, you should exercise the very best of care as to how and what you teach your children. I would say by way of advancement, in the first place,

ENCOURAGE THE CHILDREN

to observe and care for plants. Give them simple lessons of plant life from the flowering plants on the window sills of your sitting room. Instruct them concerning their leaves, stems, flowers, roots, and, if need be, concerning the insects that may attack them ; and teach them to water the plants and provide for their simple needs. Then give them plants to manage for themselves, and in the pure, bright weather of our pleasant spring-time you may further instruct them to make and manage their own beds in the open border, and to care for them. Get them to help you make your garden as a means of interesting education to them, and although the fair and delicate skin may be somewhat browned, the beautiful rosy cheek somewhat sullied, and the tender fingers somewhat hardened, yet they will be getting healthy muscles and nerves, and fine conceptions that will be worth far more than wealth to them. Flowering plants, that is, plants that are cultivated solely for their beautiful blossoms, are the best to commence with, as they most directly administer to the inherent love of beauty in the nature of the child. Thus they may be encouraged to care for other and more useful plants, as strawberries, raspberries, etc. These fruit-plants possess many advantages for education of children in the ease of management and the rich and sure rewards of beauty and pure enjoyment. Boys' gardens may differ somewhat from the girls', but the same general principles are applicable to both at their early time of life.

Take them with you in an

EXPLORING EXPEDITION

To to the fields and woods, and encourage them to find specimens of plants and shrubs, and enquire of you their names, qualities, etc. I now have pleasant memories of this very enjoyable exercise when being out botanizing with the children of the day school. They may be provided with baskets and trowels, and encouraged to carefully take up and bring home specimens of plants, shrubs, trees, leaves, nuts, or flowers they may find in their rambles. When I reflect upon the advantages for horticultural education that the children of to-day have placed within their reach, I cannot help but think that had I possessed these, as they do, what a noble specimen of cultured humanity I might have made. But I must not forget

THE WILD GARDEN.

This, for children, if properly commenced, may be a very precious investment, and a useful experience. Give them a plot of ground to be called and known as theirs. Ownership here is an important factor in the results. In some corner of the plot they may be instructed to bring and plant all those things they may find in their rambles that are wild and uncultivated, either plant, shrub, or tree, from the fields and woods. By carefully tending them they will often get fine results, and by watching their growth and development may learn many lessons of usefulness. If the pupils are advanced far enough they may be taught to plant in botanical classes, but if not, let them plant in any way that may please their fancy for the time. Let them feel that this work is theirs, and let them take an honest pride in it, and when any of their little school fellows come over to pay them an afternoon's visit, you may be sure you will always know where to find them. I know a little girl among my acquaintances, only eight years old, who has a fine collection of this sort of wild plants and shrubs in her wild garden, and I can assure you that that little girl is growing up in beauty and fine knowledge every day. By the help of her kind and attentive mother she has learned much about plants, about their names, their beauties, etc. How many of nature's treasures we have growing all over the surface of our beautiful country that if gathered up and cared for by a generous culture might eclipse even the splendors of exotic importations. Teach the children to gather and care for them. This is the kind of cultured material with which we want to build up and ennoble our country, and educate our future men and women, who shall be a blessing to the State, and an honor to the world. "Where much is given, much will be required."

A TREE IS KNOWN BY ITS FRUIT

Called out Mr. LeValley, of Ionia, who said:

This subject is not only fruitful, but very appropriate to the occasion. There are many varieties of trees both useful and ornamental; all were created for use, for the good of mankind. The first account we have of trees is in Genesis: "The Lord caused to grow from the ground every tree that is good for food and pleasant to the sight."

This is our first glimpse of horticulture, and this example has been followed all the way down to the present, more or less, as we have improved our opportunities. In the early settlement of Michigan, the pioneer found many trees that he was obliged to cut and burn; many of them bore valuable fruit, such as the oak, beach, walnut, chestnut, etc.; all, in fact, had a purpose, and all bore some fruit, but the principal crop then was ashes. But soon trees were planted in their stead that produced more valuable fruit: more in accordance with the original design, which looked for good only, from everything created. Hence the apple, pear, peach, plum, cherry, grape, and an almost endless list of small fruits, and in carrying out this design it will be no great stretch of imagination to include flowers. Although not trees proper, still they have enough of tree properties to answer their purpose; they also bear fruit sufficient for all to know them by their fruit. A wise man said, "He who plants a tree confers a benefit on his country." The miserly man plants trees that bear fruit that can be measured and sold for money. His wiser neighbor plants more; he plants the trees for profit, and also plants the trees that are pleasant to the sight. Witness the long rows of trees that line each side of our highways, and still every one of these is a money tree. When well established they add to the selling value of the property to which they belong from two to thirty dollars each; fruit by which any common man might know them. The weary traveler who enjoys the shade on a summer's day knows them by their fruit; even the dumb beasts, if they could talk, would tell all about the fruit. The trees that are good for the eyes, planted on all public grounds, especially school grounds, cause the young people, as well as the old, to rise up and call the planters blessed. This is fruit as good as cash, and as I can't exclude the flowers, for they are a part of this same whole, just a word for them, for this topic can't be squeezed into five minutes. Travel where you will through our land, where flowers abound in the front yard, the garden, or twine about the door-way, there you find strong evidences of intelligence, thrift, peace, and contentment; these are some of the fruits derived from flowers. In such a place, where all, old and young, care for and prize them, there you may safely rest for the night, for a week, or month. Who ever heard of a murder or burglary being committed by a person with a rose in button hole and a bouquet in each hand. Never; "hardly ever." No one thinks of going among the roses or lilies to hatch up crime, or plan evil deeds. Flowers have been called angels' food; whether they are or not, their fruits as we know them, are excellent, and long keeping; not like the apple, for a few months, but for years, a life time, fitting us for something better. Let this influence be such that when called to cross "the river," bright angels can attend us to the "Sweet fields of Eden, where the tree of life is blooming and fruits immortal grow."

BRING THE FLOWERS TO THE FRONT,

Was the topic upon which Mr. A. D. Healy, of South Haven, was called out. He thought we could not give too large a place to our floral treasures, in the home, in the hall, in the church, and in the park, and especially where the children are. Flowers of some kind are appropriate everywhere. He was a flower lover and a flower grower himself, and found in this branch of horticulture a rest that satisfied him as nothing else could.

A. L. Aldrich, responding to the sentiment,

"PLANT A TREE,"

Spoke as follows: I remember to have read many years ago, in a volume published by Thurlow Brown, some paragraphs which made a deep impression on my mind. He was addressing himself to a class of men who had wasted their lives, dissipated their moral forces,—in short, had lost their manhood. He said, "When you have so degenerated that you are only a burden to yourselves and a curse to your fellow men; when the future holds out to you no hope of retrieving your lost character, and presents only a dreary perspective of worthless vagabondage, then go and plant a tree,—if not in garden or field, then by the roadside, so that in the days to come the weary traveler resting beneath its shade may call down benedictions on your memory."

Twenty years ago, I knew a man in the western part of this State whose friendship I valued highly. He was a man of vigorous personality, and impressed himself strongly upon the community in which he lived, and indeed upon the whole State, for he was a number of terms a member of the legislature, and helped to make laws for the commonwealth. I refer to the late Hon. Philatus Hayden, of Van Buren county, known in his lifetime to many in this audience. In the year 1844 he planted a row of maple trees on either side of the old territorial road which ran through the large farm which was his home, for a distance of half a mile or more. In the intervening years these trees have grown strong and vigorous, with huge boles and widely expanding branches, which now interlace with each other above the center of the street. They make one of the grandest avenues I ever saw. In all that region there is nothing else so handsome in the landscape, and to drive beneath that leafy canopy on a hot and dusty day is indeed a sensuous delight.

That miniature forest is a prouder monument to the memory of the dead statesman than pillar or monolith in Greenwood or Mount Auburn. Nay, I had almost said, than a tablet in Westminster, where stand the silent mementoes of the heroes and sages of the centuries long gone by.

A few years since, I was driving in the country one day with a gentleman who was then an honored resident of this city, a good conversationist, and keenly sensitive to all impressions from nature. In our drive we passed a magnificent elm standing by the side of the country road, on the margin of a stream. It was indeed a kingly tree, with stalwart trunk and wide-spreading, graceful boughs that nearly trailed the ground. I directed his attention to it, and pausing in his conversation, he lifted his hat reverently to the solitary monarch, and I honored him for his silent worship of the beautiful as embodied in this grand specimen of the *Ulmus Americana*.

I remember once when I was a lad to have been walking along the road with my grandfather, not far from our home in Western New York, when we came upon a man who, with his assistants, was clearing the timber off a piece of woodland preparatory to building a house thereon. On the plat a few feet from the spot where they were at work was a spring which poured forth a copious stream of cold, sparkling water. It was surrounded by a grove of handsome trees. Among them I remember a wild cherry, a maple, an ironwood, a witch-hazel, a beech, and others. A little way down the stream there stood a hemlock (the tree so much admired by our Secretary). Already the "woodman's axe" had done its work upon some of these trees. The good old man approached the proprietor, and apologizing for the apparent interference, begged to suggest that it might be better for the spring if the trees in its vicinity were allowed to grow. The suggestion was taken kindly, and the trees were spared, and left to cast their shadows over the purling waters. A few years since I visited the somewhat historic spot. The house, then about to be built, had grown old in the intervening years. The trees spared by my grandfather's intervention were there, and the spring was there, pouring forth its waters, copious and cool as they had been nearly half a century before, while other springs upon the neighboring hillsides, which had been deprived of their leafy protectors, had entirely dried up, or were far less abundant in their supply than formerly. I drank of the delicious water from the spring, cool and pure as of yore, and blessed the memory of the kindly, thoughtful old man.

Not many years ago a Governor of Michigan, whom most of you knew personally, and all loved and admired, issued a proclamation, appointing a certain day, which he called "Arbor day," to be observed by the people of the beautiful Peninsular State, which was his love and his pride, and calling upon them to plant trees on that day in all its borders. You know I refer to the late Governor John J. Bagley. In response to that proclamation, on a certain day in May, of our Centennial year of 1876, more than a thousand trees were planted within the limits of this city. I myself helped to plant some of them, and you who hear me speak helped to plant some of them. And countless other thousands were planted all over this beautiful Peninsula, and are to-day standing and growing a perpetual remembrancer of the man whose busy brain and warm heart were both enlisted in schemes for the happiness, prosperity, health, and wealth, of the people whom he loved with all the ardor of a great soul, for their constant growth towards a higher and nobler civilization. I do not wonder that when he felt the icy hand of death reaching out toward him, and he wrote his "last will and testament," he gave directions that no more than five hundred dollars should be spent upon a monument to mark his resting place. Wherever on these broad Michigan plains a Centennial tree stands, there is a monument more beautiful than the costliest mausoleum; more suggestive than obelisk or pyramid, and not less beneficent than a hospital or an asylum—a lasting memento of the people's big-hearted Governor.

"Plant a tree." The proposition is in the imperative mood and present tense. I call upon all who hear me to-night to register a vow to plant a tree so soon as the genial rays of the vernal sun shall have expelled the frost from the earth. Plant trees about your homes. Plant them in your yards and your fields. Plant them in long lines along your country roads—trees that shall adorn and beautify, that shall be a perpetual sanitarium to preserve the public health, that shall temper the fierce winds to the shorn fields as well as the shorn lamb, that shall maintain an equable climate, abating the heat of summer and the vigors of winter, that shall modify radiation and rain-fall, and neutralize those destructive agencies that have denuded the country of its forests too rapidly for the public weal.

"Plant trees!"

"THE POETRY OF THE FARM"

Was responded to by P. C. Dempsey, of Ontario. He recited a verse of poetry touching upon farm life. Horticulture, said he, is the poetry of farm life. Without the beauty and satisfaction it brings into rural life it would be prosy enough. The growing of great crops of produce out of which to get a living and perhaps something more, has not in itself anything that trains the higher, purer, better nature of man. He who plants a tree, or cares for a flower, or grows a delicate fruit, for the beauty that is in them, derives a similar satisfaction to that which is reached by a strain of music, a burst of oratory, or a beautiful picture. All honor to the parents that bring up their children to an appreciation of the beauties of the farm, who educate them so that in all parts of their lives they can appreciate the rhyme and rhythm of the poetry of the farm.

Lieutenant Governor Crosby, of Grand Rapids, followed with pleasant words commending the work of the society, saying that very early in its history he had become a life member thereof, and had always noted the progressive work of the association with pride. He then spoke earnestly and eloquently upon the sentiment announced in calling upon him:

INSURE TO THE CHILDREN A LOVE OF CHILDHOOD'S HOME.

Love, he argued, was begotten by something to love. The babe learned to be affectionately fond of its mother because the mother was lovable, had attributes that begat affection. To insure to children a proper regard, a love for their homes, the homes must be made attractive, lovable; just how to do this may vary with different families. There certainly must be the proper spirit pervading the home life or all efforts to make home attractive to the young will be futile. But beyond this there should be brought into and about the home, things about which the heart tendrils will cling. The children should have a part in the adornment of the home, and the feeling should be engendered that it is their home, and they have a life interest in everything pertaining thereto. There is something very pleasant to me in the expression which I often hear on the part of married people, even with children in their own household. "I am going home thanksgiving," or "I shall spend a few days at home next month," referring to childhood's home, which is their home still. We cannot any of us do too much to make our home attractive to the children. I tell you it is nothing against a family that they prefer to be at home than elsewhere. Neither riches nor poverty can insure a love of home, but a right heart and a proper regard for the desires of the children, and an appreciation of the wants of child life.

The Hon. H. R. Lovell made a few remarks upon the legal aspect of tree planting as ordered by the Legislature. In his opinion the barking of a maple tree is a fit subject for profanity, even in a Sunday-school superintendent. He argued for a law compelling the setting out of trees, such law to make it the duty of the highway overseer to see to the proper care of those trees. But yet, he thought, the better way would be to educate the children to love and care for trees, as a pleasure and with pride.

W. W. Hilborn, of Arkona, Canada, presented a short statement concerning

SMALL FRUITS AT ARKONA, CANADA.

I have tried a great number of varieties of raspberries, and find the Mammoth Cluster and Gregg, with a variety found growing in an old plantation about five years ago (more hardy than either of the above, strong grower, very productive, size of the Doolittle, and ripens with that variety, and will stand carriage better), to be the best black sorts, and with Cuthbert and Turner for red, will make up a list that will give the best satisfaction for planting, either for home use or market.

For hardiness, great productiveness, and good quality, the Snyder blackberry stands at the head of the list with us. It is the only blackberry that we make calculations on getting a good crop from every year.

We have some forty-five varieties of strawberries growing. The Wilson is perhaps the best of the fully tested varieties for distant market, but for near market (say within fifty miles), and for great production, hardiness, and early fruit, we have nothing that will equal the Crescent Seedling. The Captain Jack is a good berry, but it often parts from the hull in picking, which spoils it for market to some extent. The Kentucky is the best late; Sharpless is gaining in favor. It may be possible but not probable, that we will find something more valuable than the above varieties in the Manchester or James Vick; what few we had in fruiting of the Manchester this season, had the same fault of the Captain Jack, parting from the hull. Cumberland Triumph and New Dominion are good. There are also some of Mr. Arnold's seedlings that promise well, of which Bright Ida is the strongest grower of any sort on our grounds; productive and of good quality; I think it will be valuable. But the sort that comes the nearest to perfection (in my estimation) in large even size of berry, form, color, quality, and growth of plant, is the Warren. I have not fully tested it as to productiveness, but think it will produce equal the Cumberland Triumph or Miner's Great Prolific. All visitors we had at fruiting time pronounced it the best berry they ever tasted. It is also a splendid grower on our soil, which is a strong clay loam.

The Marvin, which has been recommended in some localities in Michigan as a late berry, is such a poor grower it is of no value with us. We grow by the matted row system exclusively, putting rows four feet apart, and from one to one and a half feet in the row. Cultivate and keep clean first season, and mulch with straw as soon as the ground freezes; leave the straw on until after fruiting, then mow off weeds and leaves, and plough between the rows, then harrow both ways, and let it go without any more work, and set a new plantation every spring, as we find we can do so more cheaply than to clean out the old plantation, and are sure of a crop every year.

COMMITTEE REPORTS.

The following announcement of premiums had been sent out previous to the convention in connection with the scheme of topics:

The State Society offers the following list of premiums, and there should be a fine exhibit of specimens:

1. Best three single plates of winter market apples of different varieties. First premium, $2.00; second premium, $1.00.

2. Best three single plates of winter apples for cooking purposes, of different varieties. First premium, $2.00; second premium, $1.00.

3. Best three single plates of winter dessert apples of different varieties. First premium, $2.00; second premium, $1.00.

4. Most beautiful plate of apples on exhibition, color, form, general perfection, and size of specimen to rule. First premium, $1.00; second premium, 75 cents; third premium, 50 cents; fourth premium, 25 cents.

There must be exactly five specimens of each variety, and the Awarding Committee will consider, not only the value of the varieties for each particular purpose, but the character, beauty, freedom from defects, and general perfection of the specimens, and be governed otherwise by the rules of the Society.

5. Most tasteful arrangement of cut flowers, ferns, etc., made by some member of the family in whose home the flowers are grown. First premium, $2.00; second premium, $1.00; third premium, 50 cents.

The Genesee County Horticultural Society is desirous of having a good display of vegetables, and offers the following prizes:

6. Best and most neatly arranged display of vegetables for family use. First premium, $2.00; second premium, $1.00.

7. Best five named varieties of potatoes; exactly five tubers of each variety; quality, freedom from blemishes, adaptability to home use rather than size, to rule. First premium, $2.00; second premium, $1.00.

8. The State Society also takes this opportunity to offer its diploma to the branch society showing the best record of actual membership and work accomplish ed in 1882. Reports to be made to Secretary Garfield on or before the date of the Annual Meeting, and to be acted upon by the Executive Board and read at the meeting.

REPORT UPON FRUITS.

The first committee to report was that upon fruits, by P. C. Dempsey, chairman.

Your committee takes pleasure in announcing its satisfaction with the beautiful and worthy exhibit. Many things we find that are not entered for premium, but have been brought to add to the interest of the meeting.

Very fine pears, mostly of the Lawrence and Beurr D'Anjou varieties, are shown by E. H. Scott, of Ann Arbor, and J. W. VanDeman, of Benzonia.

Fine Malaga grapes are placed on exhibit by M. Edwards, of Flint. Iona, Diana, and Kalamazoo varieties are shown by N. E. Smith, of Ionia. A remarkable exhibit of the Prentiss, in compact, well formed clusters, we found shown by T. S. Hubbard, of Fredonia, N. Y.

An exhibit of the Niagara is made by C. L. Hoag, of the Niagara grape company. This variety is not recommended for its long keeping qualities, but shows very fairly. We cannot help finding fault, however, with the plan of disseminating the vines. The Agawam is placed on the tables by E. LeValley, of Ionia, in fine condition.

A very attractive display of Florida oranges is made by Mrs. Damon Stewart, of Flint.

Many other plates of fruit are shown, but your committee could not ascertain the names of the parties who were so thoughtful as to thus contribute to the entertainment of the fruit-growers present.

The following awards have been made under the offers by the society:

Class 1.—First premium to R. D. Graham, of Grand Rapids. Second premium to Eaton county Horticultural Society.

Class 2.—First premium to John Morley, Flint. Second premium to Eaton County Horticultural Society.

Class 3.—First premium to R. D. Graham, Grand Rapids. Second premium to A. S. Partridge, Flushing.

Class 4.—First premium to Eaton County Horticultural Society. Second premium to N. E. Smith, Ionia. Third premium to J. W. VanDeman, Benzonia. Fourth premium to A. S. Partridge, Flushing.

P. C. DEMPSEY,
J. J. PARSHALL,
J. J. ATHERLY,
Committee.

REPORT UPON VEGETABLES.

The report of the committee on vegetables covers classes six and seven, for which the Genesee County Horticultural Society offered premiums as follows:

Class 6.—Best and most neatly arranged display of vegetables for family use. First premium, $2.00; second premium, $1.00.

Class 7.—Best five named varieties of potatoes; exactly five tubers of each variety; quality, freedom from blemishes, adaptability to home use rather than size, to rule. First premium, $2.00; second premium, $1.00.

In class six there were but two entries. First premium was given to that of John Morley, composed of two varieties of turnips, one of blood turnip beets, one imported sweet Swedes; two varieties of celery, red and white; one of salsify, one of hollow crown parsnip, one of Hubbard squash, two of onions, white and yellow, five fine cauliflower, specimens ot mammoth sweet peppers, one of carrot, seven of potatoes: Late Rose, Brownell's Beauty, Compton's Surprise, Early Rose, White Star, Burbank's Seedling, and Snowflake.

Second premium, Eaton County Horticultural Society. One variety of shorthorn carrots, one of white carrots, one of hollow crown parsnips, one of blood turnip beets, one of imported sweet Swedes, and four varieties of potatoes: Late Rose, Early Rose, Prolific, and Beauty of Hebron; also, Early Golden sweet potato.

Class 7.—First premium to Eaton County Horticultural Society, their exhibit being Snowflake, St. Patrick's, Grove, Early Ohio, and Beauty of Hebron.

Second premium to John Morley, upon the White Star, Early Rose, Snowflake, Burbank's Seedling, and Beauty of Hebron.

Your committee would also especially mention the exhibit of Edward Menyham, consisting of Harvers, Chitfield's Seedling, Mammoth Pearl, Jersey Blue, and Beauty of Hebron.

Harry Wesson, of Flint, has a fine lot, but rather large for table use, being the Shortwell's Seedling, Mammoth Pearl, Beauty of Hebron, Chalbred's Seedling, Harvard, Humbold Red, and Jersey Blue.

S. S. Bentley exhibited Early Vermont.

Wm. D. Green, of Eaton Rapids, exhibited Burbank's Seedling, Mammoth Pearl, and Peachblow.

J. P. Lewis, of Windsor, Ontario, showed the Lincoln Rupert potato.

John Morley also had a second set of five varieties of potatoes, being the White Star, Early Rose, Compton's Surprise, Brownell's Beauty, and Seti Revi.

We would say that none of the sets of potatoes really met our ideal of the best five varieties of potatoes for Michigan.

C. B. STOWELL,
R. D. GRAHAM,
H. W. DAVIS,
Committee.

REPORT ON JELLIES, SYRUPS, PREPARED FRUITS, ETC.

Your committee would beg leave to report as follows:

Amber Syrups.—Several exhibits from O. H. M. Huested, Holly; from W. H. Underhill, Thetford; from Leonard Wesson, Flint; and J. L. Wilcox & Son, Flint. All these samples are exceedingly fine in appearance and quality, and promise grand results in this important product of our State.

Jellies.—J. D. Baldwin, Ann Arbor, exhibited several fine samples of grape jelly, of plum jelly, of apple jelly, of quince and apple jelly, of blackberry jelly; also of plum marmalade, of grape marmalade, of raspberry jam, of blackberry jam, of peach jam, and spiced grapes. All these samples are exceedingly fine and highly commendable. Also from Emil Baur, Ann Arbor, grape jelly, grape marmalade, and red raspberry syrup; also very fine. A. J. Crossman, of Davison Station, exhibited a fine sample of apple jelly. Your committee would desire to express their highest appreciation of these samples of jellies, etc., and would most earnestly hope that their manufacture and use may be much more largely encouraged as a great boon to the public.

Wines.—One exhibit of white wine from Concord grapes by LeRoy Parker, Flint, one sample of the make for 1876, and one sample of the make for 1880. Both these samples were highly commendable, and to the taste of experts gratifying.

Honey.—There are very fine exhibitions in the comb as worked up by the bee, and also extracted. August Kœppen, of Flint, and also M. S. West, Flint, and W. Z. Hutchinson, of Rogersville, are the exhibitors. The samples are all that could be wished, and very creditable to the exhibitors of so fine a luxury.

Tea.—A specimen of Chinese tea from a lady of South Carolina and the following letter were placed in the hands of your committee:

Varennes P. O., Anderson County, S. C., Nov. 25, 1882.

MR. C. W. GARFIELD: Through the Husbandman, published at Elmyra, N. Y., I noticed that your Horticultural Society met at the city of Flint on the 4th, 5th, and 6th of December. Thinking you would not object to a contribution from myself in the form of Chinese tea, inclosed I send you a specimen of home cured tea, a sprig, and a few seeds. The tea plant is an evergreen of the hardy kind with us; it needs no protection through our winters here. You can say to the committee that the sample I send I want them to test. Yours respectfully,

Miss M. C. McFall.

We deeply feel our inability to do justice to this part of our work, but have made great effort to find the value of the sample by comparison with commercial samples in the market, and by drawing and testing. By comparison we find that it will rank with the variety of tea called Oolong, which is sold in our market for 75 cents per pound. By testing we find it equal in quality, but of lighter color. In strength we find it equal to the comparison, and also high in aroma and flavor. Your committee would express their deepest appreciation of this article as a product of our domain, and would feel that if such fine results can be accomplished, then the efforts that have been made by our government for its culture and manufacture have not been in vain.

All of which is respectfully submitted,
B. Gott,
Mrs. A. L. Aldrich,
Evart H. Scott,
Committee.

RESOLUTIONS.

The committee on resolutions first reported upon a matter referred to them as follows:

We, your committee on resolutions, find it our sad office to record the death of J. Webster Childs, a constant and most useful member of our society from the first year of its inauguration; always faithful in duty, wise in counsel, and genial in fellowship, we bid him a most regretful farewell, and beg to be entered on the list of mourners with his most estimable family, and many friends throughout the State.

On motion the resolution was adopted.

The committee further recommended the adoption of the following:

Resolved, That we learn with great pleasure that the State Board of Agriculture has elected Prof. Satterlee, a leading member of our society and of our executive board, to fill the chair of horticulture and landscape gardening at the State Agricultural College, and we bespeak for him success in his new field of work.

Resolved, That it is with a great deal of pleasure that we express our obligations to our many good friends of Genesee County Horticultural Society for the cordial reception they have extended to us as a society and as individuals, and for the many acts of kindness that have been extended to us on every hand from the time of our arrival; and that we return our sincere thanks to the citizens of Flint for the unbounded hospitality extended to us in their homes, and also that the cordial heartfelt thanks are due to the managers of the Flint high school for furnishing us their beautiful lecture room for the meetings of the society and for the exhibition of fruits, vegetables, and plants, and also thank the principal and pupils of Flint high school for the excellent and appropriate music furnished by them at the several sessions of this society; and also

Resolved, That Prof. Graves and his class merit our warmest thanks for rendering the splendid music we have listened to to-night.

All of which is most respectfully submitted,
W. W. Hilborn,
O. R. L. Crozier,
C. L. Hoag,
Committee.

On motion the resolutions were adopted.

Mr. O. R. L. Crozier, a member of the committee, presented the following, which was adopted:

Mr. President: As my associates on your committee on resolutions are gentlemen from abroad,—Mr. Hilborn from Ontario, and Mr. Hoag from New York,—I beg leave to submit the following in addition to our joint report:

An encouraging feature of our meeting now closing is the presence of Mr. Dempsey as delegate from the Horticultural Society of Ontario, and others from that province, and several gentlemen from New York, and from our own State, not heretofore at our meetings. These gentlemen have added very much to the interest and usefulness of the meeting. We say, because we most thoroughly mean it, come again! your visit has done us much good. May you and those who are so fortunate as to have you for neighbors, be abundantly blessed with the richest gifts of horticulture. We trust you and we are all wiser and better, and so will be more useful from having enjoyed the preparation for labors at and drill in this meeting. We thank those friends and co-laborers for their very agreeable company and intelligent aid during our meeting.

O. R. L. Crozier.

The announcement was made by the secretary that the executive board under class eight of the scheme of premiums, had awarded the diploma of the society to the Benzie county society; and further, that the Ionia county society had received a certificate of merit for valuable work accomplished in 1882.

The secretary further announced the next convention of the society to occur in February at Marshall.

Meeting closed with the doxology, led by Prof. Graves.

ANNUAL MEETING OF THE ILLINOIS HORTICULTURAL SOCIETY.

REPORT BY PROF. W. J. BEAL, OF THE AGRICULTURAL COLLEGE.*

This strong and well-known society has just closed a three days' session. Your delegate gives below some of his notes and impressions.

O. B. Galusha, of Morris, has acted most acceptably as secretary for thirteen years or more. He positively declined re-election. The society lets him down easily by electing him president. Mr. Lew Small, of Kankakee, where the winter meeting was held, was run in as secretary by local influence. He is a young man who has not heretofore acted with the society. The leading men of such a society who perform the work,—spend time and money from year to year to migrate about the State to attend its meetings are not very numerous in any State. We know how it is in Michigan. How should we feel, and what would be the feeling of the working members of our society, should we accept an invitation to hold our annual meetings in Ann Arbor, Flint, or Pontiac, and after going there some *Small,* though sharp fellow, should run in a crowd of boys, who pay a dollar apiece, carry the election, and quietly retire?

Mr. Small had evidently cultivated cheek, and had taken lessons as a saloon politician. He knows how to pack a caucus. At least, that was the way it looked to your delegate.

We have known a hard worker—a capable, thrifty farmer to be beaten by a keeper of a saloon at the election of directors. The result was disheartening and disastrous to a fair run in the interests of the farmer. It seems the executive board in Illinois felt indignant. They created the office of assistant secretary, who is to make the report and draw the pay.

This assistant is A. C. Hammond, of Warsaw. As there is now no money in it, and not an overwhelming amount of honor, the future action of Mr. Small is awaited with some interest. Only two or three active members cast votes for Mr. Small.

Many of the papers presented consisted of reports of permanent committees on different departments of horticulture and kindred topics. At Alton, the peach buds have already been killed by the cold snap. It has been a bad year for grapes; the crop light; the wood not often matured, which forebodes a light crop next year.

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* Prof. Beal was elected a delegate to the Illinois Horticultural Society at our annual meeting in Flint, and this is his report as delegate.

Some very touching resolutions were offered and unanimously passed concerning Arthur Bryant, Sr. He is an old and valued member, and is not likely to live more than a few days.

Much of Illinois seems to be adapted to the iron-clad apples, such as Ben Davis and Rome Beauty; to the Wild Goose plum and toughest grapes; to the Snyder blackberry and Duchesse pear. Pear blight is rampant; insects are terribly sharp and profusely abundant. The markets are good, and this spurs on the fruit growers to supply St. Louis, Chicago, and the North, with early fruits. More and more attention is given to selecting favorite spots for certain fruits. Efforts are now seldom made to raise the best fruits on every farm. It does not pay. This is a country of great and severe extremes of weather. It is dry or wet, hot or cold, and often windy.

The rust of blackberries and raspberries is a prominent foe. Some think they have combatted it successfully with potash; but more experiments are needed. In many places they only attempt to take two to four crops of berries and dig out the briars, and plant in a new spot. Grape vines which overbear never recover. A complete failure of peaches every other year is by no means considered the greatest calamity. The trees get a rest and the curculio is much reduced in numbers. A dead curculio, like a dead Indian, is considered the safest. The apple crop this year has been very good. Long lived orchards of apples, pears, or peaches, are not generally profitable in Illinois. Fruit from young trees is the best. Some of the old trees die; others dwindle and become unprofitable. Of many sorts of apples the trees are set close and dug out when about twelve years old, at least by some growers. A young orchard is most profitable. Peach trees are allowed to bear three or four crops and are then dug out. Trees are not set on the same ground till after one or more crops of some other sort. Old trees are likely to become weak and break to pieces because the wood becomes tender or rotten. Secretary O. B. Galusha had tried to kill the white grub in his strawberries with salt, but it did not succeed.

A lively discussion followed on the value of stripping the bark from apple trees to induce bearing. Several had failed by getting one crop and killing their trees. It should be tried with caution, taking care to see that the tree is well fed and not allowed to bear heavily. Experts favored taking off carefully a circle of bark four to twelve inches long as early in the season as the bark would slip well. Buds then set for a crop the next year. To saw about a trunk is dangerous unless care is used.

E. C. Hathaway, an expert, thinks corn and peas are fit to eat two days earlier for getting seed one degree north, and so on, two days for every degree north. There was a good exhibit of potatoes. It was quite generally believed that the Beauty of Hebron and Early Ohio were not surpassed in Illinois. The Early Ohio was preferred in southern Illinois, because it kept better in spring. Professor Burrill had found soft soap and kerosene in equal quantities well mixed, then diluted with twenty parts of water and sprinkled on cabbages, a good remedy for the cabbage worm.

Tree agents now sell about all the trees and plants. People seldom buy directly of nurserymen. Tree peddlers are often cheating the people. Tree growers regret it nearly as much as the purchaser, whose regret is almost certain to come when his plants begin to bear. Ignorant men are not always the only ones imposed on, but active work in a live horticultural society is the best known preventive against the persistent attacks of the itinerant sellers of trees and vines.

There are some very large seed dealers. All of these send out some poor seeds. There seems to be a growing necessity for small, careful growers all over the country. There is a talk of having some wax models of fruits prepared for a museum.

Among those from other States were J. W. Ragan, of Fillmore, Indiana; C. Plumb, of Wisconsin, and the writer of these notes. Mr. Ragan and Prof. Beal were elected honorary members.

EMBELLISHMENT OF SCHOOL GROUNDS.

BY SECRETARY GARFIELD.

The State Horticultural Society became interested in the subject of ornamenting school grounds more than two years ago; and during 1881 made the subject a special feature of its work. A full report of methods pursued and results attained was published in our last volume of transactions.

Although the same amount of effort in this direction has not been put forth during the past year, we have by no means abandoned our aim in securing to Michigan more beautiful school surroundings. At every convention this matter fills some niche in the programme of exercises; in every local horticultural society that is organized the members are urged to make education of their people in the direction of greater care given to school premises, a prominent part of the work attempted by the society; articles and short items have been prepared for the press; lectures have been given by the Secretary before the State Teachers' Association and before farmers' institutes; D. M. Ferry & Co. have furnished free seeds for school grounds; resolutions have been presented to meetings of educators, discussed and passed, looking toward united action in the cause; in truth, everything has been done that we could well do, to keep the subject before the people.

If our system of education in its parts, was better linked together, a better system of machinery could be put in motion for the accomplishment of practical results. As it is, individuals work independent of each other, and there is little emulation aroused, and no enthusiasm exhibited.

The Secretary takes the liberty of making the following suggestions concerning the most promising methods of pursuing this matter further:

1. An impetus might be given the planting of trees and shrubbery about school yards, if the Governor, in his proclamation for Arbor Day, should call special attention to the subject; urging the patrons of schools, and especially the children, to make the ornamenting of school premises with new plantations a special feature of Arbor Day for 1883.

2. Urge upon people interested in the subject, to secure a slight appropriation at the spring town-meetings for the purpose of offering prizes to the schools making the most successful efforts in beautifying the yards; the offerings always to be in some apparatus or books that will add materially to the means of instruction in the schools that secure the prizes.

3. Secure some practical interest, if possible, in the subject by the depart-

ment of Public Instruction at Lansing; at least enough that the matter shall be given a special place in every State institute held under the management of the department.

4. Ask the authorities of the State Normal School to insert somewhere in their curriculum a short course of instruction that shall have for its direct object the practical employment of horticultural and botanical knowledge in the embellishment of school grounds, with such material as can be employed in giving valuable lessons to the children in our schools; and further ask that examinations be given upon this subject as upon any other study in the course; thus giving to the term

KINDERGARTEN

A meaning quite in accord with its literal translation, and to the furtherance of its methods an impetus that shall be felt in our rural schools.

5. Interest the few teachers who attempt something in the way of ornamenting the school premises with the aid of the pupils, to give, in detail, their methods and results, so that these may be published for the benefit of others who may attempt something of the kind.

6. Induce, if possible, local agricultural societies to offer small premiums to schools for the display at their annual fairs of some results of undertakings in this direction, in the form, perhaps, of bouquets, cut flowers, designs, etc.

7. Importune the State Teachers' Association to give the matter their thoughtful consideration, with the hope of evolving some good methods of prosecuting this work through the enlistment of the teachers in our union schools, who have under their tuition so many young people who go directly from them into rural schools as teachers.

7. Lastly we suggest the following as a sort of syllabus, to be used as a skeleton, to be clothed properly and given life at institutes, conventions, and associations, which meet in the interests of schools or rural occupations.

ORNAMENTING SCHOOL PREMISES.

1. Purposes to be subserved:
    a. Awakening love for the school and its work;
    b. Add means of illustration;
    c. Develop observing powers in children;
    d. Instruction in practical horticulture;
    e. Education of good taste which shall reach into the homes;
    f. Give a park-like effect to school yards;
    g. Add a means of discipline;
    h. Give variety to school life.
2. Difficulties to surmount:
    a. Prejudice of patrons;
    b. Lack of training in teachers;
    c. Unsettled work of teachers;
    d. Narrow limits of grounds;
    e. Infringement upon the play-ground.
3. Methods of work:
    a. Protection of the premises;
    b. Who shall do the work;
    c. The children as policemen;
    d. Improvements to consist of
        1. Specimens from native flora;

        2. A good lawn;
        3. Paths and drive;
        4. Botanical museum and arboretum;
    - *e.* The landscape gardening feature;
    - *f.* The botanical feature;
    - *g.* The experimental feature;
    - *h.* Effects of the labor upon pupils.

4. Educational inducements:
    - *a.* Teachers' recreation;
    - *b.* Widened influence of tuition;
    - *c.* Introduction of a factor that shall thread into every study and displace nothing.

In connection with this general subject the Secretary asked Mr. J. N. Mitchell, principal of the grammar school at Grand Rapids, to give an account of his efforts at school-yard embellishment with a class of pupils whose age and mode of life would have discouraged most of us at the outset. Mr. Mitchell kindly responded with the following letter:

FLOWERS AT THE GRAND RAPIDS CENTRAL SCHOOL.

CENTRAL SCHOOL,
Grand Rapids, January, 1883.

Secretary C. W. Garfield:

DEAR SIR,—Last spring, in accordance with your suggestion, I sent to D. M. Ferry & Co., of Detroit, for a school collection of flower seeds. The result has been so gratifying that I believe it to be worth reporting.

As you were once a student here, you no doubt remember the desolate and neglected appearance presented by the east half of the central grounds. The pile of loose sand mingled with the brick and mortar debris scattered here years ago when the house was built.

The meager vegetation consisted of a few dandelions and many stools of bur-grass or sand-burs as they are called here, the *Cenchrus tribuloides*, and much tribulation have they caused us, for the burs of this plant, though not fitted by nature for flight, in some strange way are wafted every fall into the rooms even of the second and third stories of our building, and invariably light in the immediate neighborhood of a boy who is about to be seated. Perhaps this fact is one of the points that pricked us on to a determination to have more pleasing surroundings; at all events we proposed to our department to have a flower bed, and the proposition was immediately accepted.

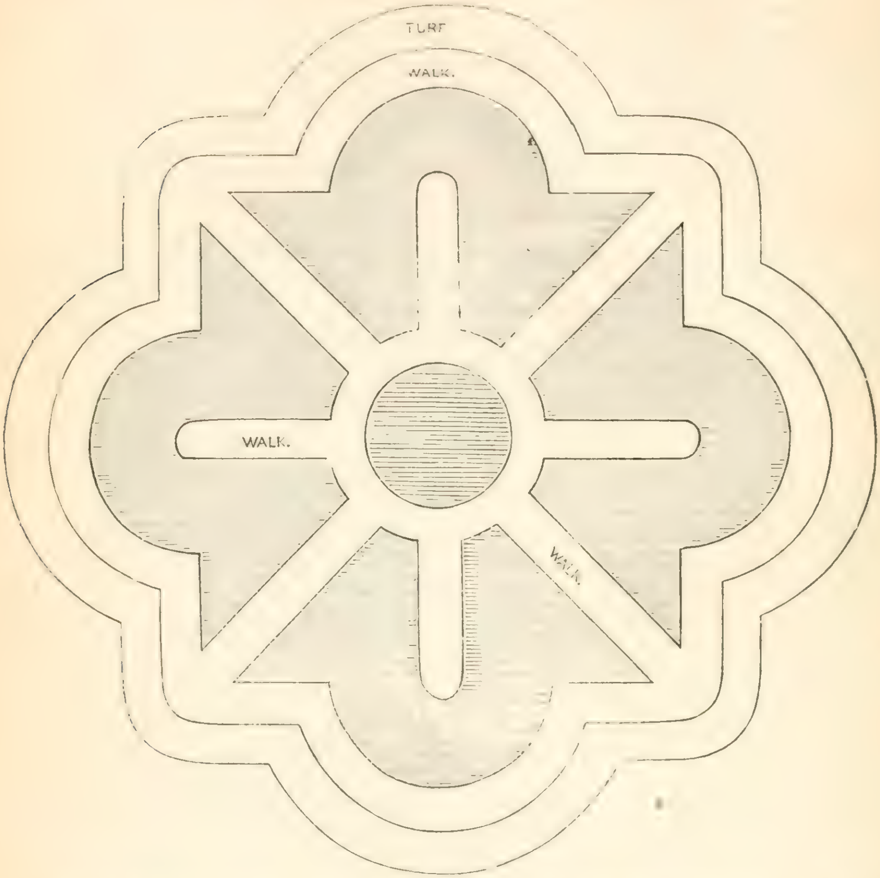
The seeds came early. Spring came late. A "committee on shovels and spades" volunteered, and we commenced an excavation near the building, nearly thirty feet square and eight or ten inches deep.

This done—and willing hands made quick and easy work of it—we sought Supt. Daniels, who had taken much interest in our plans from the start, and through his magic influence saw a quantity of school ashes metamorphose into several loads of good soil, which in due time were dumped into our excavation.

By the time this was worked mellow and into the desired shape, more ashes had been converted into a good load of excellent turf. Part of this was cut into four inch strips and used for edging, while an eighteen inch strip was laid on the outer margin of the outside path extending around the bed. This margin we hope to see widen into a lawn at no very distant day.

I send a plan of our bed, as it proved pleasing in design and very convenient to work with, as any part of it could be reached without injury.

[Scale eight feet to the inch.]



The first dry weather after the bed was finished the sowing began. This was given into the charge of the committee on "seeds and weeds." It was evident, however, on account of the nearness of the summer vacation, that we would have no *flowers* of our labor before September. Accordingly, a collection was taken and, with the resulting several dollars, verbenas, pelargoniums, heliotropes, pansies, ragged robins, phlox, and several other varieties, making about three hundred in all, were secured from a green-house, and our garden was in bloom forthwith. It was admired until the close of school, and was the one beautiful spot on our grounds.

When we returned in September, thanks to our kind-hearted janitor and the wet season, we found our bed covered with bloom. The seeds had grown, and the Ferry plants were in bloom with the rest.

There were balsams, nasturtiums, petunias, poppies, mignonette, mist on the mountain, allyssum, asters, pinks, and four-o'clocks.

The portulacca came up well, but was destroyed accidentally while quite small.

Our bed remained a thing of beauty until late in the fall, but the joy yet lingers for the turf, still green, is a constant reminder of our success. Nor was this all,—so well pleased was the superindendent, that he continued to convert ashes to earth until nearly one hundred loads of street cleanings had been spread on the grounds adjacent to our bed, preparatory to adding more sod in the spring.

As a result of this dressing, the sand-burs were giving way to date-palms which in the fall were seen by the dozen from six to ten inches in height.

We have planted ivies at the base of our building in convenient places, and next spring we hope to see the work of beautifying carried on.

Thanking you for your suggestions and kind interest, and wishing you abundant success, I am, very truly yours,

J. N. MITCHELL.

REPORTS

OF

LOCAL SOCIETIES,

AUXILIARY

TO THE

MICHIGAN STATE HORTICULTURAL SOCIETY.

1882.

REPORTS OF AUXILIARY SOCIETIES.

There are 28 societies auxiliary to the State Horticultural Society. All of them are entitled to a place in this volume, but all have not availed themselves of the privilege.

It is very desirable that every branch should at least give an abstract of its work for publication. It is only by this means that the parent society can get at the needs of the various localities, in which it has a special reason for interested work. I trust that at least another year we may have a short report from every one. The names of all members of branch societies, together with its membership in the State society, are all given near the close of this volume.

SECRETARY.

MASON COUNTY FRUIT GROWERS' ASSOCIATION.

REPORT BY G. C. MC CLATCHIE, PRESIDENT.

At a meeting of the fruit growers of this vicinity held March 10th, 1882, a society was organized, to be known as the Fruit Growers' Association of Mason County. The following officers were elected:

President—Geo. C. McClatchie.

Vice Presidents—Wm. Warner, Richard Hatfield, John Good.

Secretary—L. W. Rose.

Treasurer—O. Quackenbos.

Executive Committee—Charles Houk, Henry Beebo, L. W. Rose.

Meetings have been held on the first Saturday of each month since, with one exception, at which discussions have been had which have been interesting and profitable to us; but being only beginners in fruit growing, they probably would not be of general interest.

President Lyon met with us in June; his ripe experience was listened to with pleasure and profit.

Our experience in raising plums—there are orchards of several thousand trees in this vicinity—might warrant us in giving our opinion as to varieties most successful here. We have found the following among the best: Lombard, purple magnum bonum, red magnum bonum, yellow egg, Prince Englebert, Bradshaw, Coe's golden drop, German prune, Pond's seedling, Canada egg, and green gage. We find purple magnum bonum the most healthy, best growing tree, and one of the best, if not the best, of plums in size, quality, and color. Coe's golden drop is least liable to rot; green gage stands next to it in this particular.

LAPEER COUNTY HORTICULTURAL SOCIETY.

REPORT BY H. W. DAVIS, SECRETARY.

The Lapeer County Horticultural Society was organized February 10, 1882, with fifty promised charter members. Some of these have moved away, and others failed to come in as agreed, but enough new ones have been obtained to bring our membership up to 50.

Our officers are:

President—F. McElroy.

Vice President—Henry Lee.

Secretary—H. W. Davis.

Treasurer—John Abbott.

We have had two meetings since organization; one in April, the other in November. Our topics were "Best varieties of apples for Lapeer county," and "Black Knot," respectively. Otherwise than this we have ingloriously done nothing.

We are now preparing to get on the working harness, and hope the present season will find us meeting once each month, with profit to us all.

ADRIAN HORTICULTURAL SOCIETY.

REPORT BY W. OWEN, SECRETARY.

This society became an auxiliary to the State society last year, and hoped to largely increase its membership, but circumstances have rather favored the prosperity of the Grange at the expense of the society. But all are working in harmony for the progress and development of horticultural science.

The following are its officers and members:

President—J. W. Davis.

Vice President—S. B. Mann.

Treasurer—Artimus Sigler.

Secretary and Librarian—W. Owen.

Its members are Peter Collar, A. Sigler, J. W. Davis, W. Owen, D. G. Edmiston, C. W. Sheffield, Adrian; J. F. Clark, Clinton; W. R. Keeney, T. J. Sutton, Tecumseh.

GENESEE COUNTY HORTICULTURAL SOCIETY.

REPORTED BY A. L. ALDRICH, SECRETARY.

Pursuant to a good deal of judicious agitation, largely on the part of Hon. A. S. Partridge, and to a call quite extensively published, a number of gentlemen interested in the subject of horticulture in Genesee county, met at the court house in the City of Flint on the 21st day of February, A. D., 1882, for the purpose of organizing a society in its interest. A considerable number of citizens were present. C. W. Garfield, secretary of the State Horticultural Society, was present, and in a few practical remarks explained the workings of the society, and what experience had shown to be the best methods in the organization of local societies. Mr. Partridge also made some general remarks upon the desirability of the contemplated action. A form of constitution was presented, and after some slight modifications, suggested by local considerations, was adopted.

Pursuant to its provisions, the following officers were elected:

President—Hon. Asariah S. Partridge, of Flushing.

Vice President—C. T. Rosenkrans, of Flint.

Secretary—A. L. Aldrich, of Flint.

Treasurer—Leonard Wesson, of Flint.

A vice president for each township represented was also elected, as follows: Burton, J. M. Van Keuren; Clayton, Norman A. Beecher; Flushing, George A. French; Genesee, Chandler H. Rockwood; Grand Blanc, M. P. Perry, Mt. Morris, R. S. Pailthorp; Atlas, D. D. Pierson; Flint, C. C. Warner.

Provision was made for still further perfecting the organization by the appointment of a committee to draft by-laws.

Subjects for discussion were arranged for the next meeting as follows: "The Pruning and Trimming of Fruit Trees, Vines, Shrubs, etc," and "The Transplanting and care of Nursery Stock."

Thus it will be seen that the society started out with the theory that it had practical work to do from the very initial.

The total number of names entered upon the roll at this meeting was twenty.

The next meeting of the society was held at the City Hall on the 14th of March. Eleven new members were added to the roll. A set of by-laws was presented and adopted.

Very interesting and instructive discussions were had upon the subjects provided for at the first meeting, a considerable number of the members participating. The remarks were of a practical character, being the results of the observation and experiences of men who have made fruit culture and tree planting a business for years. It is probable that more really valuable information was disseminated through the medium of those discussions than through any other agency ever operating in this county. At a subsequent meeting of the society an important paper on the subject of "Picking, Packing, and Marketing Apples," was read by Mr. Rosenkrans, and was discussed by other members. The paper was filed in the archives of the society.

The Genesee County Agricultural Society having adopted a resolution to assign the awarding of premiums on all horticultural products to the Genesee County Horticultural Society, a committee of its members was appointed to meet a like committee from the Agricultural Society to arrange details.

This joint committee met at the office of the Secretary of the Horticultural Society on the 8th day of April, and organized by electing Mr. Rosenkrans chairman, and Mrs. Dan. H. Church secretary. A premium list was arranged and other details were discussed and settled, and as a result, this department of the annual agricultural exhibition, together with that of the apiarian and dairy products, was wholly given over, in its management and awarding of premiums, to the Genesee County Horticultural Society.

At the March meeting also, a committee was appointed to report on the subject of tree-planting along the highways. The committee reported recommending that the township vice presidents of this society confer with the highway commissioner upon the subject, and urge him to perform his duty in the premises; also in favor of enforcing the law prohibiting the running at large of stock in the highways.

A resolution was also adopted, putting the society on record in favor of the general planting of trees and shrubs on all available spaces, for their sanitary and civilizing effects upon both the present and succeeding generations.

At this meeting also a very interesting paper was read by Mr. Wm. Winkley on "Horticulture."

At the June meeting of the society it was expected that there would be an exhibit of small fruits and flowers. The exceptionally backward season, however, disappointed this expectation, so far as the fruits were concerned, but, thanks to the taste and enthusiasm of the ladies, the room was beautifully decorated with flowers.

An essay on "Horticultural Knowledge" was read by Mrs. A. L. Aldrich, and Mrs. M. C. Chapman favored the meeting with an interesting paper.

President Partridge was appointed a delegate to represent the society at the summer meeting of the State society at Pentwater, with Mr. Rosenkrans as alternate.

Committees were appointed to report on the best five varieties of winter apples for market for eastern Michigan, on stone fruits, and on pickling.

At the September meeting, Mrs. Partridge read a paper on putting up pickles, and Mrs. Passmore read another on preserving stone fruits.

Arrangements were made at this meeting for sending an exhibit of fruits, by the society, to the annual fair of the Northeastern Agricultural Society at East Saginaw on the last days of September. As a result of this action, the county was represented at this fair by a notable exhibit of apples, pears, and evaporated fruit, jellies, syrups, etc., which took the first premium in the horticultural department. The same exhibits were returned here and were entered by the individual owners for premiums at our own county fair, winning a good number of local prizes.

At the October meeting committees were appointed to make the necessary arrangements for the winter meeting of the State Horticultural Society in this city, beginning on the sixth of December.

That meeting was duly held, and its records to be published in the annual report of the society will show, I think, that the Genesee County Horticultural Society, during less than nine months of existence, has made for itself a place in the horticultural history of the State which reflects upon it at least no great discredit. Beginning with a membership of twenty, it now bears upon its roster the names of fifty-four ladies and gentlemen, all industrious workers in this domain of human effort to adorn, beautify, and enrich the fair earth which is the common heritage of humanity.

I should do violence to my own sense of justice if I were to close this report without paying a tribute to the zeal and efficiency of our President, Mr. Partridge, Vice President Rosenkrans, and Mr. Wesson, our Treasurer, in all matters pertaining to the interests of the society. Mr. Beecher is justly entitled to praise for the admirable manner in which he has put the society in a commanding position in our local agricultural exhibition. Mr. John C. Dayton and Mr. E. J. Pierson should be mentioned in flattering terms for their tact and energy, especially in the matter of preparing entertainment for those in attendance upon the meeting of the State society in this city.

I think the facts will justify me in saying that through the agency of our society this county has been placed in the position, horticulturally, which it is entitled to hold. Its capabilities and resources and its actual products are placed before the world as they have never been before. Through its agency, actual cash value has been added to every fruit bearing tree, shrub, and vine in the county. Genesee is marching to the front.

The achievements of the past hold out encouragement for the future. The society has demonstrated its *raison d'etre* by what it has accomplished. Let's keep at work.

ANNUAL MEETING.

The annual meeting of the society was held on Tuesday, the 27th day of December, 1882. The annual reports of the Secretary and the Treasurer were presented and approved. The report of the treasurer showed the society to be entirely out of debt, and a balance of $21.90 in the treasury. The old officers were all re-elected.

All the old members present renewed their membership, and six new names were added, making a total of sixty.

Arrangements were made for an interesting anniversary meeting, to be held on the 20th of February, 1883.

SPRING LAKE HORTICULTURAL SOCIETY.

REPORTED BY CHAS. F. WASSON, SECRETARY.

The Spring Lake Horticultural Society was made auxiliary to the State society, March 28th, 1882, although an organization had been in existence for a number of years. With a few exceptions monthly meetings have been held, but the attendance has been small. During the winter season it is contemplated holding weekly meetings, though with what success remains to be seen.

The fruit crop here has been a fair one with the exception of apples, which were a small crop. The rose bug did considerable damage during the fore part of the season, and the thrips injured the grape crop to some extent. The present prospect for a crop next season is good. The late fall gave the trees a good chance for ripening the wood, and our fruit men are greatly encouraged. No case of yellows has made its appearance here yet, although our fruit-growers are constantly on the watch for it.

At the annual meeting held Saturday evening, December 16, the following officers were elected for the ensuing year:

President—Warren Gee.
Vice-President—Chas. M. Kay.
Secretary—Chas. F. Wasson.
Treasurer—Geo. Seagrove.

OCEANA COUNTY HORTICULTURAL SOCIETY.

REPORTED BY W. J. CANFIELD, SECRETARY.

President—C. A. Sessions, Sammons' Landing.
Vice President—L. M. Hartwick, Pentwater.
Secretary and Treasurer—W. J. Canfield, Pentwater.
Librarian—Wm. Hudson, Pentwater.
Executive Board—A. E. Sauter, Seth Darling, A. Brillhart, A. C. White, H. C. Lockwood.

The work of our society for the past year has been one of success, and cannot fail to be of great advantage to the horticultural interests of this section of the State. Our list of members has been larger than in any previous year of our existence, and the interest manifested the past year indicates an assured success for our society in the future.

The winter, spring, and early summer meetings, were each and all well attended by the members of our society, and largely by citizens of the villages in the different parts of the county where monthly meetings were held; the addresses delivered, the essays and papers read were highly interesting and instructive. The discussions of these papers by members of the society after their presentation brought out the individual opinions of the members of the society, showing thought and study, and certainly must produce good results to all. The impromptu discussion of subjects for the different seasons—tree planting, fighting the curculio and other insect pests; the care of winter fruit, etc.,—giving as it does the individual success and failure of the different members, is one of the best features of our meetings.

The meeting of the State Horticultural Society at Pentwater, by invitation of our society, was the event of the past year. That that meeting was a success, all who attended, and especially those who participated in its deliberations and discussions, we have heard but one opinion expressed, either by members of our our own society or by members of the parent society, and visitors from abroad. [For report of this meeting see another page of this volume.]

Our society made exhibits at the State fair, and also at the fair at Grand Rapids; the exhibits made and the premiums received were very flattering to this section of the State.

After the June meeting our monthly meetings were practically abandoned during the fall owing to the busy season, but were resumed in the the autumn and there seems no abatement in the interest of our members, which is a good omen for our future success as a county society.

BERRIEN COUNTY HORTICULTURAL SOCIETY.

REPORTED BY GEO. F. COMINGS, SECRETARY.

This society entered upon its second year under somewhat discouraging circumstances; business interests had called its president and secretary to other places, and the last meetings of the year 1881 were almost wholly given up, or attended by a very few; at the beginning of the year 1882, an earnest effort was made by some of our members to awaken an interest and inaugurate a series of meetings which should prove interesting and profitable. This effort was attended with a good degree of success, as the meetings rapidly increased in attendance, and were kept up without any falling off in attendance or interest through the winter or spring. During the summer and fall, the meetings have been less frequent and with a smaller attendance, and it seems as if the close of the present year would find us in much the same poor, dying, state, as was noted one year ago. The officers, as a general thing, have been prompt and regular in attendance, and perhaps it would be hard to tell just how we fail of keeping up the interest; perhaps one of the prominent reasons is that the most of us are engaged in growing a variety of small fruit, a business which, during the summer season, requires the closest attention and activity of him who would succeed in it. For this reason, largely, the culture of mind and sociability is laid aside, and all energies are bent towards the guarding of our delicious fruits from their countless enemies, and developing in them the best and most satisfactory growth of fruit and stalk.

At the meeting of December 26, 1881, the following were elected as officers:

President—S. G. Antisdale, Benton Harbor.

Vice-Presidents—S. H. Comings, S. Cook, D. N. Brown, H. Merry, J. K. Bishop.

Secretary and Treasurer—Geo. F. Comings, St. Joseph.

There was little done but routine work. S. H. Comings was requested to give a report of the annual meeting of the State society held at South Haven at the next meeting, which was called for January 9, 1882, two weeks later.

The session of January 9 was well attended, the report of Mr. Comings was listened to with interest, and following it there was a short discussion on pear blight and grape rot, the latter disease having made its appearance in somewhat alarming proportions during the season then just closed. There was a full account given of its appearances and ravages, but little was known as to remedies or preventatives. It was looked upon with grave apprehension by all, as our county is fast becoming as noted as a fine grape producing section as it once was for fine peaches.

At the meeting of January 23 the subject of new varieties of fruit was taken up and discussed. Among grapes the Worden, Brighton, and Moore's Early were highly spoken of by several who had grown them. The Niagara had some friends who had made arrangements for planting out vineyards of it in the spring. Among strawberries the Sharpless and Crescent seemed to be more fully endorsed than any of the other newer varieties; doubt, however, was expressed as to whether any new kind was yet introduced which would supersede the old and well tried kinds. A pleasing addition was made to this meeting in the form of some nicely rendered music. W. A. Smith was requested to prepare a paper on peach tree planting for the next meeting, which was called a week later.

The meeting of January 30 was mostly occupied in listening to the paper prepared by Mr. Smith. The paper was interesting, and was listened to with attention. The views of the writer were that the only serious obstacle to the growing of the peach again here was the yellows, and believed with proper precaution we could again be successful in its culture. A short discussion followed it being conceded by all that we should at once see that all diseased trees are dug up and burned.

The meeting of February 6th was given up to an interesting paper by Dr. Winans, on "Artificial means of making trees fruitful." The writer, and many who spoke in the discussion following, favored root pruning or girdling of trees not productive, and many successful incidents were cited in support of this practice; others thought the process attended with too much risk to be advisable. The meeting was also favored with a paper on "Tree planting" by R. C. Thayer, and several pieces of music.

The session of February 20th was opened with a paper by S. Cook, on the "Cherry." He claimed the lake shore was peculiarly adapted to the growing of the tender, sweet cherries. The most successful kinds were Black Tartarian, Gov. Wood, Yellow Spanish, Knight's Early Black; the Richmond and May Duke were recommended for varieties of sour cherries. The paper drew out quite an interesting discussion on varieties to plant, means of saving the fruit from rot and the birds.

Following this was a discussion on the raspberry. The Turner, Brandywine, and, for an early variety, the Kirtland were well spoken of by very many, and are considered reliable and profitable. The Turner excelling in quality, but being a little soft. Brandywine a very handsome berry, firm, and good for long shipment. Reder's seedling is a very promising new variety, its origin being St. Joseph; supposed to be a seedling of the Philadelphia. It is hardy, large, firm, and very productive; many who have fruited it would place it at the head of the list of reds. The meeting adjourned for two weeks, with the blackberry and pear chosen as the subjects for discussion.

The meeting of March 6th was opened with a report from Mr. Jones, of Coloma, of his visit to the State society meeting at Hudson. Mr. Cook read a short paper on the pear, which was followed by a discussion on this valuable fruit. The varieties found most profitable in our county, are as follows: Doyenne Boussock, Clapp's Favorite, Bartlett, Howell, Beurre D'Anjou, Beurre Clairgeau, Louise Bonne de Jersey. The Beurre D'Anjou seems to be gaining in favor every year; the Bartlett has been, and is still, planted more than any other kind, and is a deservedly popular pear. The rest of the session was given to the blackberry. The two most popular kinds are the Lawton and Willson's Early, the latter for the past few years being planted most extensively. Some advocated the laying down of the canes in the fall to protect them from the cold; a few favored planting the Snyder or other ironclad varieties, as more profitable than the finer, but more tender, Lawton and Willson.

At the following meeting, of March 20th, Mr. A. J. Knisely read a very interesting paper on "highway tree-planting." There was considerable interest awakened in this subject; several of the most successful planters urged the importance of cultivation the first year or two. The maple, chestnut, catalpa, ash, oak, etc., were spoken of as desirable trees to plant. The society offered a premium of $10 to any of its members who should set out the largest number of ornamental trees in the highway, and attain the best results with them.

At the meeting of April 10th, W. A. Smith read a paper on Insect Enemies. In it he made a strong plea for the birds, and also spoke in terms of condemnation of the common house cat, as a foe to those by whose mercy it was tolerated. The codling moth could be exterminated, or so decreased as to do little damage, by concert of action in putting bands on the trees and destroying the worms which collect under them. The pasturing of sheep or hogs in the orchard was recommended as helps in exterminating this pest. The most effectual way of dealing with the peach borer was digging them out with the knife. The curculio could be jarred upon sheets and killed, and plums, peaches, and cherries saved from its ravages. At this meeting a committee was appointed to see if Arbor Day could not be observed by the society in planting trees along some of our streets, school-yards, and parks. The plan, so far as anything being done by the society as a body, failed, although many members observed the day to quite an extent, in planting trees along their own premises, and perhaps more trees were planted along the highway last spring than in any previous year.

At the meeting of June 10th, J. P. Thresher read a paper on the "Humbugs," to which horticulturists are often subjected. The paper was spicy and very much enjoyed, although the honest fruit grower was often pictured as the victim of sharp and designing agents. It was generally conceded that there are many evils attending the packing and marketing of our fruits, which should be remedied, among them the great diversity of size, and style of package, the packing and shipping of so much inferior fruit faced up with good, were things which should be corrected. At this meeting several were appointed as delegates to the June meeting of the State society, which was to be held at Pentwater.

The meeting of July 8th was held in Conkey's opera hall, and was largely attended. The time was occupied by W. A. Smith, who gave a report of the State society's meeting at Pentwater. Following this report was a short discussion as to whether Berrien County Horticultural Society should compete at the State fair for some of the premiums offered for exhibits of fruit. No action was taken in the matter at this meeting. A committee was appointed to see the several town boards, and urge them to appoint suitable persons as yellows commissioners, who should insist on the digging out and burning of all diseased trees. One of the pleasing things of the meeting was the rendering of a poem, by the poet of our society, Mr. U. B. Webster. It was a parody on the "old oaken bucket," and was prepared expressly for a strawberry festival which was to have been given June 29th. There were several plates of fruit on exhibition, one especially fine, of the Reder seedling raspberry. Mr. S. Cook exhibited one of his seedling cherries, which seemed to promise well for a late cherry. It is a cross between the Yellow Spanish and Black Tartarian; of good size, very firm, in color dark red, quality medium; healthy, strong growth, and productive. Mr. Cook has named it Michigan beauty. The best part of this entertainment, and one in which all could take part, was enjoyed in Grange hall, to which the society and many of its friends repaired, and found a bountiful supply of strawberries, ice cream, and cake in waiting. Dr. Hurd, of Chicago, and Rev. McElwee, of Benton Harbor, added to the festivities of the hour, some happy remarks.

The meeting of August 13th was devoted to discussing the need of a more liberal appropriation from our State to the State Horticultural Society, which would enable it to prosecute its work with more efficiency. It was thought some action should be taken by our local societies, and a petition sent to our Legislature asking for help to carry on a work of vital importance to our State. At this meeting a committee was appointed to see to collecting fruit for an exhibit at the State fair, and of making other necessary arrangements for it.

The meeting of September 16th was given up wholly to selecting and putting in readiness for shipment the fruit gathered and brought in by the committee and other members of the society. Mr. W. A. Brown, of Stevensville, was appointed to take charge of the fruit and represent the society at Jackson, and it was largely owing to Mr. Brown's persistent and untiring efforts and skill, that the society succeeded in securing the first premium of $20 for the best and largest collection of market fruits. The following week Mr. Brown took the collection to Grand Rapids, where he succeeded in carrying off one or two first premiums.

The meeting of October 28th was thinly attended, it being a busy time, and the weather threatening rain through the early part of the day. Mr. Brown gave an account of his trip to Jackson and a glimpse of what was to be seen and learned by a visit to the State fair; his report was supplemented by remarks from others who attended the fair.

Perhaps after reading this somewhat rambling report, one might be tempted to ask, What good have these meetings done? Has anything been accomplished for Berrien county? In this, as in any other direction, it is easier to ask than to answer questions, still we think the question can be satisfactorily answered much more fully than time or space will admit of here. These societies and their meetings are, and have been, one of the potent agencies in placing our State in the front rank of fruit producing States of our union. These societies are educators in many directions; they make their members better thinkers, writers, and speakers; in short, better men. They cultivate mentally and socially, as well as teach how to cultivate more intelligently and profitably. They should unite their members in concert of action, to resist the ravages of insect enemies, the rapacity of transportation corporations, or of commission merchants; whoever or whatever would rob them of their rightful rewards. We trust Berrien County Horticultural Society has but just entered upon what the future may prove to be, a long and useful career not only to its individual members but to our whole county and State.

The bright prospects of early spring were blasted by successive frosts and cold storms, and the early season was full of gloomy forebodings, but with the bright and genial sunshine of August and September many doubts were dispelled and a much better harvest than was feared rewarded the husbandman. Apples were perhaps the nearest to a total failure ever known in this section, and were of a very poor quality. Grapes suffered severely from the late frosts and again still later from mildew, and were probably not to exceed one-fourth to one-third of a crop. Indeed the season just closed is the first in many years in which the Concord grape has failed of being highly remunerative. Pears were also a light crop and small and inferior in appearance. Berries were plenty with the exception of strawberries, which were thinned by frost. Blackberries were the largest crop probably ever grown, as high as 4,000 bushels being shipped in a single day. There are many fine vineyards planted out and from those well established as satisfactory results are obtained as could be expected from peaches, a net income from $150 to $300 per acre being realized for a series of years in succession, and, as previously remarked, our county is fast becoming noted as a producer of large quantities of fine grapes. Our fine climate, good soil, nearness to such a market as Chicago, and the ease and certainty with which so great a variety of fruits can be profitably grown render this one of the most desirable sections to be found in the most desirable State of our union.

HOLLAND COLONY FARMERS AND FRUIT-GROWERS' ASSOCIATION.

REPORTED BY ISAAC MARSILJE, SECRETARY.

OFFICERS.

President—Arend Visscher.
Vice Presidents—Geo. H. Sauter and John Coatsworth.
Secretary—Isaac Marsilje.
Treasurer—Chas. Scott.

Our society has, for the year about to close, been in a fairly prosperous condition. During the year several meetings have been held, at which meetings matters pertaining to fruit culture were discussed. The topic for discussion at the meeting for February 18, 1882, was "The profitableness of peach culture in this vicinity." The discussion was opened by Mr. C. A. Dutton, after which nearly all the members exchanged views on the subject, to the interest of all present. It was further decided that the discussion be continued at the next meeting and that the same be confined to "The profitableness of peach culture as compared with the raising of ordinary farm crops," which proved a very interesting subject, and notwithstanding the farm showed its bright side, peaches carried the day.

At a meeting held April 22, 1882, Mr. C. A. Dutton read a paper on "How can we grow perfect apples," followed by a general discussion of the same subject. At the same meeting the president read some extracts from Prof. Kedzie's essay on the use of salt as a fertilizer.

At the next meeting held May 27, 1882, the topic for discussion was "What is the cause of the yellows or rust on the plant of the black raspberry, what the cure?" This topic was discussed at some length, but the general opinion among the members was that destruction of the plants effected the only cure.

During the fruit season our fruit growers were too busy to hold meetings, and we think we can safely state that all feel well satisfied as to the "net returns" at the close of the season. Our present membership is as follows: Thomas S. Purdy, Prof. Chas. Scott, Geo. H. Sauter, Daniel Beartch, Adrian Van Duine, Isaac Marsilje, Fred L. Sauter, Albert H. Dutton, Chas. A. Dutton, John Coatsworth, John M. Kerkhof, N. W. Bacon, Chas. L. Waffle, G. J. Hekhuis, R. C. Nichols, G. Campbell, A. Visscher, M. M. Fuller.

EATON COUNTY HORTICULTURAL SOCIETY.

REPORTED BY S. R. FULLER, SECRETARY.

Eaton County Horticultural Society was organized February 4, 1882, by the aid of Chas. W. Garfield, secretary of the State Horticultural society, and was located at Eaton Rapids. The officers elected were:

President—Wm. P. Green.
Vice President—H. A. Shaw.
Secretary—S. R. Fuller.
Treasurer—M. I. Winter.

The society decided to meet monthly, and at the first meeting the names of twenty-one members were enrolled and each received from the State Horticultural Society the annual reports of the society since and including the volume of 1876. Subjects of interest have been discussed as follows: "Pruning of fruit trees," "Care of young trees," "Cause of thrifty trees dying in mid-orchard during winter," "Best mode and time of setting trees," and "Flat culture vs. hill culture for potatoes and nearly all vegetables." This society has now a membership of thirty-two. At our last meeting, November 18, 1882, Mr. W. K. Gibson, of Jackson, gave an address on the culture of the pear and grape, which address was listened to with interest and great satisfaction by the members of the society.

IONIA COUNTY HORTICULTURAL SOCIETY.

REPORTED BY JAS. H. KIDD, SECRETARY.

OFFICERS:

President—A. J. Webber.
Vice-President—E. LeValley.
Secretary—James H. Kidd.
Treasurer—Job Pierson.

The first year of our society has been, we think, very successful. The total membership is now eighty-seven. All joined since the date of organization, March 25, 1882.

Two meetings were held during the year, one June 27th; a rose and strawberry meeting, and was largely attended; the interest was very gratifying, and the exhibition of fruits and flowers very good, we thought. Several papers were read by members of the society, and the discussions were full of interest.

The September meeting was held in Armory hall and lasted two days. There was a large attendance and the show of fruits was very good, especially in grapes and pears. The exhibition of flowers attracted much attention and admiring comment. Very few varieties of grapes were fully ripened, the Concord as usual proving itself the best outdoor grape, although Mr. LeValley thinks highly of the Wilder. Mr. Hosford exhibited a white seedling grape which, if really a seedling, ought to be ranked as an acquisition. He also has a variety of the Concord which he named "Hosford's improved Concord," that is also an acquisition. J. H. Kidd exhibited 16 varieties of late summer and autumn pears. He fruited over 20 varieties this year, and regards only two as first rate, viz.: "Bartlett and Beurre D'Anjou." The latter is in his judgment the best of all, and adapted to this locality. It is excellent either on pear or quince stock, hardy, bears young and freely, does not crack or rot at the core, is of good size, fair, handsome, and in flavor good enough. He recommends that the Anjou be planted in preference to any other pear, not to say any other fruit. Bartlett comes next. Clapp's Favorite rots badly; so does Onondaga. Flemish Beauty is so liable to crack as to be nearly worthless. Howell is inferior in quality. For an orchard for profit he says plant three Anjous and one Bartlett.

The blight he has been successful in heading off by using the knife with a bold hand. Amputate if it takes the entire tree and burn it. He has a Lawrence, cut down in summer of 1879 for blight, to within a foot and a half of the ground, the stump being left. It grew, made a new tree, which this year bore a fair crop. This past summer he cut a Belle Lucrative down in the same way. It is growing, and may do as well as the Lawrence. The whole top of the tree blighted and it hung full of fine pears. It went into the fire pears and all. The blight had communicated to two adjoining trees—a Clapp and Doyenne D'Ete, which were cured by cutting off a few limbs. Blight this year in his orchard attacked Belle Lucrative, Howell, Duchesse, Doyenne D'Ete, and Clapp; but Anjou, never, though he has more of that sort than any other. Sheldon is excellent, but even that is not as good as Anjou. Pears, Mr. K. says, are more reliable than apples—bear more quickly—and he does not lose so large a percentage of pear trees by freezing out and blight combined, as he does of apples by freezing alone. It is his judgment that the State society should encourage planting the Anjou largely, and discourage the planting of most other sorts, except for exhibition and experiment. There is no doubt about it being profitable to grow, but a pear tree should be frequently examined from spring to fall for the first appearance of blight. If the disease is taken in time, it may be headed off. It can not be cured. Whatever part of a tree has been reached by it, is already dead, and should be cut off several inches below where it appeared, and the balance of the tree may be saved. There is no doubt in his mind about it being infectious. It goes from one tree to another. The only safety is vigilance. Stamp it out when first it appears. And even this vigilance is less trouble than that which is required to save the plum crop from the ravages of the curculio. In a word he can raise pears (provided the right kinds are planted) more easily, surely, and at less expense than plums, and more quickly than apples. His trees bear the second year from planting.

EARLY HORTICULTURAL HISTORY OF IONIA COUNTY.

BY E. LE VALLEY.

Having in view the importance of preserving the early history of fruit growing in Ionia county, I have gathered the following items:

The first settlers in this county cut their way through 100 miles of unbroken forest in 1833, but with all their cares and labors they did not forget to bring with them fruit, seeds, pits, cuttings, and small trees, and were soon blessed with cultivated fruits. The first apple trees were planted in the fall of 1833, by Geo. W. Case, Erastus Yeomans, Samuel Dexter, and Alfred Cornell, within the present city limits. Mr. Cornell also planted apple seeds, peach and plum pits, for a nursery the same year. He sold his first trees in 1836. The first grafting in the county was done in the spring of 1839, in the Cornell nursery. A nursery was started in the township of Portland about the same time by Willard Brooks and Mr. Hall. From this time on trees were planted by nearly every new comer, and grafting soon followed the planting. Apple orchards were set from 1836 to 1839 by Alonzo Sessions, John E. Morrison, Wm. Babcock, Levi Taylor, Mr. McKelvey, Porter Place, Mr. Chubb, Charles Gott, Mr. Knox, Mr. Brooks, Mr. A. Newman, and many others. From 1839 a general assortment of fruit was added to orchards. The first peach orchard planted was by the writer in the spring of 1839. Elder John Van Vleck, of Palo, planted an orchard of peaches about the same time, all seedling trees, the pits being brought from Western New York. These trees bore fruit in 1842. In 1847 peaches were sent to Milwaukee. By grafting and budding the best varieties were secured, and this, together with good care of the orchards, has made Ionia county what it is to-day, one of the best fruit counties in the State. The grape, one of the best fruits we grow, was planted first in 1844. The Isabella and Delaware varieties first, and a few years later the Concord was introduced here by Mr. Geo. Hosford, from Massachusetts; it is now the leading variety in the State. Although the grape is not a specialty in the county, the fact that over 100 tons were grown in 1882 will give some idea of what we are doing in fruit culture.

GRAND RIVER VALLEY HORTICULTURAL SOCIETY.

REPORTED BY W. N. COOK, SECRETARY.

The interest in the meetings of the society has been fairly kept up during the year.

At the December meeting an interesting paper was read, and discussion followed on the cultivation of northern sugar cane, and the manufacture of sugar and syrup from the same, showing that the experiments in different parts of the northern States was a success, and that good sugar and syrup was just as sure to follow intelligent work in that industry as the miller is to make good flour from No. 1 wheat, with the best of facilities for manufacture, so that it only rests with the farmers to commence the growing of the cane and make a start on the most profitable and promising business of the country.

At the February meeting a fine display of fruits and flowers was shown. This was brought out by the offer of small premiums, and a large meeting and an interesting one was the result, bringing out an attendance of sixty ladies and gentlemen.

At the April meeting it was decided to hold a strawberry and flower exhibit in June, with the design of awakening an interest among amateur growers of fruits, flowers, and vegetables. Under the management of the committee, consisting of Messrs. Bradfield, Garfield, Rowe, and the Secretary the exhibition came off at Leppig's Hall on the 27th and 28th of June. A very fine display was made in all the departments. The attendance was not what we could wish, yet on the last evening was quite good, and the society feel that this, its first effort in this direction, was a success, and that these exhibitions will result in the attainment of the object for which they are given.

At the May meeting Mr. Wm. N. Rowe read a paper on the subject of "Annuals, and How to Grow Them," which is appended to this report. A paper prepared by Mrs. Alice R. Garfield for this meeting, is also appended to this report.

The society also made through its committee, Elwood Graham and Benj. F. De Cou, an exhibition of fruit at the State Fair in Jackson. The entry was made for the largest and best collection of fruits, the display consisting of ninety varieties of apples, twenty varieties of peaches, two plates each of ten varieties of pears, twelve varieties of grapes, four varieties of plums, four varieties of crabs and one of quinces. Upon this exhibit the first premium of $50 was awarded. The committee also entered two collections of fruit at the fair of the West Michigan Agricultural and Industrial Association, and secured first premium on each.

The memberships for the year numbered nineteen.

At the annual election of officers the following members were elected to fill positions:

President—Charles W. Garfield.
Vice President—Albert J. Hovey
Secretary—Robert D. Graham.
Treasurer—Samuel L. Fuller.

Executive Board—William K. Munson, William K. Emmons, W. N. Cook, Elwood Graham.

ANNUALS AND HOW TO GROW THEM.

BY WM. N. ROWE.

SOWING SEEDS.

Place—1. Hot-bed or cold frame. 2. Shallow boxes, pans, or pots. 3. Open ground.

The soil needs special preparation and should be of a light, friable nature. Leaf mold, decomposed refuse hops, sandy loam, or even common sand will answer the purpose, but whatever is used it should be thoroughly pulverized and carefully sifted. If you haven't a coarse sieve punch an old pan full of holes as a substitute, for it is very important to get rid of hard lumps, sticks, and stones that are so liable to cover fine seeds and hinder germination. If you are favored with a hot-bed place about eight inches of good soil upon the heating material and then sift on two inches of light soil in which to sow your seeds. If you use shallow boxes, pans, or pots sift all the soil used and heat it hot in the oven so as to kill the worms and insects that may be in it. Put the soil in your boxes three or four inches deep and place them in south or east windows, where the plants can be nearly as well raised as in a hot-bed and with much less care. Keep the temperature as near 65° as possible, the more even it is the better they will thrive. If you sow all your seeds in the open ground do not be in a hurry. Wait until the ground is warm and then by all means make a regular seed bed. Pulverize the soil deep and sift upon the surface two or three inches of light earth to receive the seeds, and depend upon it a little extra work of this kind will pay you well.

A FEW GENERAL RULES.

Level the soil so the surface will be smooth. Sow in drills three or four inches apart made by pressing the soil gently with the edge of a piece of lath according to the size of the seed to be sown. If about the size of balsam or aster seed the depression may be from one-fourth to one-half an inch deep, but if fine like petunia or gypsophila seed, the ground should be merely smoothed down by the edge of the lath and only a very light sprinkling of fine soil sifted over them. Do not sow too thick, but drop carefully at regular intervals. This will save the labor of thinning and enable you to tell about what proportion of the seeds have grown.

It is a good plan to save a few seeds of most kinds for a second sowing, so in case of an accident to your beds or boxes you will not be nonplussed, and then again you can better maintain a complete succession of flowers. Cover by sifting on clear sand if you can get it easily, and if not use the same soil prepared to receive the seeds. Press down gently with the flat side of your lath or a piece of board so that the seeds will be evenly covered and protected from air and light. Before watering place some strips of lath edgewise between the rows and cover with old newspapers, or what is still better an old flannel blanket, so that the seeds may be watered more easily without being washed out and also kept as near as possible in total darkness until the seeds have sprouted, when the covering should be gradually removed.

Let me emphasize this point, for more depends upon it than a casual observer might think. Cover the seed bed or box in some way so as to keep it dark until the seeds begin to grow, and if they have any life in them they will not disappoint you. Use warm water and apply slowly with a sprinkler having a fine rose, or as an alternative use a whisk broom, but do not pour it on as is sometimes done and wash half the seeds out of the ground. Keep the surface of the soil moist but not too wet. Close watching is necessary.

CARE OF YOUNG PLANTS.

As soon as they are up nicely stir the ground frequently with a sharp stick or an old fork, and whenever it appears dry sprinkle with tepid water. If they come up too thick, thin out freely, for you had better have a few good strong plants than a lot of weak spindling ones.

Sometimes young plants in seed leaf are attacked by a minute fungus and suddenly wither up or damp off. If you notice any such symptoms transplant at once into shallow boxes prepared the same as for the seed. This makes a little extra work sometimes, but it is a sure cure; and as thousands of plants may be destroyed in a night, it doesn't pay to run any risk, for your plants will be all the stronger and better for transplanting.

PREPARATION OF FLOWER BEDS.

Determine the shape, then drive sharp sticks in the ground close together, drawing a stout cord around them. Cut the margin carefully and if the soil is very poor throw out four or five inches of it and put in its place a mixture of well rotted manure and light garden soil about ten inches deep. This will raise the center a few inches higher than the outer edge, which is very desirable for drainage; and the flowers will appear to much better advantage.

If the soil is already very rich apply a mixture of clear sand and light garden soil five or six inches deep, thoroughly mixing and pulverizing the soil for ten or twelve inches. Remove all stones and sticks by carefully raking the surface smooth and clean.

TRANSPLANTING.

Choose a cloudy, moist time if possible, and water the seed bed thoroughly so that in lifting up the young plants with a trowel or old knife the tiny fibrous roots will not be broken, but instead there will be a ball of earth clinging to them. You will need to make the holes larger to receive the plants, but so much the better. Fasten the end or lower half of the root by pressing the dirt firmly against it from the side; then fill up with fine soil, leaving the surface loose. If the earth is very dry pour a pint of water in the hole before you put in the plant, and if the sun comes out bright, shade with shingles or leaves.

A piece of stiff, brown paper wrapped loosely around the stalk so that the lower edge comes just below the soil will prevent the ravages of cut worms.

LOCATION AND EFFECT.

A good location for a flower bed may be in front of the main entrance to your dwelling or opposite a conspicuous bay window, or at a curve in the walk; but beds bordering on a walk or in the center of a lawn are not considered in accordance with good taste. Size is not always an element of beauty; a small bed nicely proportioned and neatly arranged produces a far better effect than a mass of plants jumbled together without system or method. For small gardens, beds cut in the green turf are more satisfactory than the old plan of bordering and encircling with gravel walks, and can be more easily kept in order. Ribbon beds or carpet beds tastily arranged are very ornamental.

CULTIVATION.

Stir the ground frequently and more deeply as the season advances. Cultivation is moisture. You will not be troubled so much with weeds, and by keeping the ground mellow your plants will make a strong, vigorous growth.

Liquid manure or soap suds applied once or twice a week is very invigorating, and will increase the number and size of the flowers. Cut the flowers freely, even if you can make no use of them, for the more you cut them the more they will bloom. If allowed to go to seed the strength of the plant will be exhausted in developing seeds, and the number and size of the flowers will be diminished. A few loose flowers tastily arranged have a charming effect upon the breakfast table, and if given to a sick friend how much joy they might bring.

CARE OF HOUSE PLANTS.

BY ALICE R. GARFIELD.

Thrifty, well grown plants in the house are a great help in beautifying and making a pleasant and cheerful place in which to live, especially during the dreary months of the year when out of doors nature's face is looking sad and forlorn. I say thrifty plants for I am not so sure of having the readers of this article agree with me if I were to say simply house plants, for I have seen those, among my own plants, too, that were an eye-sore to everyone looking at them; such as I have in mind are mere skeletons with a few leaves at the ends of the branches; one sees them oftener in geraniums than any other plants. Why they are kept is a mystery, except it may be the owner is fondly hoping that they may possibly "turn new leaves" and cover the bare branches, for "while there is life there is hope."

It seems more natural for some people to have nice plants than others, and the question arises in the minds of many, why is it that my plants do not grow as thriftily as those of my friend? The answer to the question is that your friend understands the needs and requirements of her plants better than you do. One good rule which will apply to plants in general is to treat them as nearly in accordance with nature's methods as possible.

Of course, in caring for plants in the house there are a good many things to contend with. They need plenty of light, a moist atmosphere, fresh air, and plenty of water. Now, how are we to furnish these requisites to healthy plant growth. First, about light; and I will give you the plan of my window garden, and most of my experience. Almost anyone can have as good a place for plants as I have for mine, for they are in an east window, and the window is under a porch, consequently the plants have to be contented with the bit of morning sun that can peep under the verandah, but they are thankful for that, and seem to exhibit their thankfulness in their very appearance. I had some shelves made of pine with a moulding around the edge projecting an inch or more above the bottom, and stained the moulding to represent walnut. The object of having the moulding project above the shelf is to allow for the filling in of clear sand for the pots to stand upon. The shelves are arranged upon iron brackets, and are strong enough to support a good deal of weight.

Plants, as I said, need a moist atmosphere, and this in a room where there is no steam produced is rather hard to furnish them, still they can in a measure be afforded this luxury. The sand on which the pots are placed should be kept wet, and this serves to keep the bottom of the pots damp; and another way I have found to be very beneficial to the plants is to sprinkle them frequently, although judgment must be exercised in this matter for rough, hairy plants, like the Begonia rex and Chinese primroses, are injured more by sprinkling than otherwise, but most of the smooth leaved plants seem to like the showering; and still another point about sprinkling: The leaves ought not to be wet while the sun is shining on them, for the drops of water act as lenses and are apt to burn the leaves. This is one of the things which nature teaches, for she very seldom waters her plants when the sun is shining brightly upon them.

Care must be taken in supplying the plants with water. The earth must not be kept soaked, but water must be furnished when the earth is dry and before the plants wilt. It is much better to give them a copious supply at one time than to give a little every day when they do not need it. Often the pots are filled so full of dirt that they will not hold enough water to reach the bottom of the pot and consequently when the plant is turned out of the pot only the top earth comes out with the plant and perhaps the crock is half full of dry dirt. This ought not to be so. In sprinkling my plants I use a whisk broom—dip it into the water and shake it over them. I find it better than a sprinkling can, for with that the water is as apt to go on the carpet as where you wish it to, and with the broom you can put the water where needed. As the water drips off the plants the sand absorbs it, and in that way the sand is kept wet.

I do not know as plants require any fresher air than people do, so I will only say in regard to that, that if one's house is supplied with as fresh air as it ought to be for health the plants will not suffer for the want of pure air. There is another hindrance which many find to successful plant-growing, and that is insects; but I have had no trouble in that direction since I have treated my plants to a shower bath in the morning. Plants grown for foliage simply ought not to have the roots crowded, but as soon as the pots are well filled they ought to be repotted; but with geraniums, when you particularly desire the flowers, you will have more bloom to keep the plants crowded into pretty small pots and feed them well with liquid manure, but do not fertilize plants that are not in a healthy growing condition.

If in the few thoughts which I have given, anything has been written that will be of benefit to anybody I shall be repaid for giving my bit of knowledge in caring for house plants.

MUSKEGON COUNTY HORTICULTURAL SOCIETY.

BY H. H. HOLT, SECRETARY.

The officers of this society elected at the annual meeting on the 4th day of February are:

President—Samuel B. Peck.

Vice President—James Dean.

Secretary and Treasurer—Henry H. Holt.

Monthly meetings of the society have been held as heretofore, on the first Saturday of each month, and have usually been fairly attended.

At the meeting in March, John L. Van Pelt, of Lake Harbor, read an interesting and instructive article on the Diseases of the Grape, a copy of which is herewith appended.

At the May meeting, S. B. Peck read a carefully written article on "Muskegon County as a Fruit Growing Locality."

The society, in connection with the July meeting, made a strawberry and floral display which was well attended and was regarded as a success. At this meeting W. M. Collier read a well prepared essay on Strawberry Culture, which is herewith appended.

Here it may not be amiss to state that the strawberry crop in this county the past season was a very profitable one, and that a large amount of berries was marketed, aggregating at least $25,000 worth at Chicago prices, the product of the townships of Laketon, Lakeside, Muskegon, Norton, and Fruitport, in this county. The amount of land in cultivation is rapidly increasing, and the surety of success more thoroughly demonstrated each year.

The society gave a very pleasant picnic at Mona Lake on the 9th of September, which was very largely attended, on which occasion S. B. Peck read a paper, which was well received, on Grapes and Grape Culture.

On the 14th of October a display of grapes was made in Holt's museum, which was well attended, and at which a fine display of that fruit was to be seen.

SKETCH OF MUSKEGON COUNTY.

BY H. H. HOLT.

The soil in the east part of Muskegon county, particularly in Ravenna, Casnovia, and Holton, is a rich, heavy loam; in the middle and western parts it is lighter, and, for the most part, rather sandy.

THE CROPS.

Wheat, corn, and potatoes can be raised with greater or less success on a large portion of the land in the county; while the raising of vegetables for market has been pursued with good success.

FRUITS.

It is to fruit culture that particular attention is called, more especially grapes and berries. The aggregate value of the yield of the latter in the six townships in this county bordering on Lake Michigan having been upwards of thirty thousand dollars the past season, and the number of acres of these berries is rapidly increasing each year.

"STUMP LANDS."

The lands in the middle and western parts of the county to which attention is called as being suitable for the raising of grapes and berries are, for the most part, "stump lands;" they can be purchased at from three to fifteen dollars per acre, in an unimproved condition.

CLIMATE.

The climate is very good. The season is later in spring and fall than in the interior of the State, owing to the influence of Lake Michigan.

LOCAL INDUSTRIES.

There are about sixty large saw mills in the county, besides numerous other manufacturing industries. In these saw mills an immense amount of lumber is manufactured, aggregating at least 800,000,000 feet annually, and employing a large number of men. More than this, Muskegon is a city with a population of 15,000, and has a suburban population of at least 3,000 within a radius of two miles, affording one of the best local markets to be found in the West.

CLIMATIC INFLUENCES.

Particular attention is called to that portion of this county lying along the shore of Lake Michigan, and within a distance of six miles of the lake, for the reason that the climate of this locality is materially improved by being so near to this body of water. This is indicated by the thermometer, which scarcely ever sinks lower than ten degrees below zero, and often does not fall below zero at any time during the entire winter, as was the case in the winter of 1881–82. The advantage peculiar to this locality is fully demonstrated by any of the isothermal tables of the northwestern states, from which it will be seen that the climate of the central portion of the eastern shore of Lake Michigan is as mild as that of a latitude 100 miles farther south; and, further, that the climate of the vicinity of Muskegon county is even more mild in winter than that of the southern portions of this shore of the lake.

This is to be accounted for by the fact that the south part of this shore does not have the advantage of the long sweep of the wind over the lake when it comes from the west, and particularly the southwest, that is enjoyed further north; and it will be remembered that many of the coldest days of winter are those when the wind is in the southwest. As an instance of this we will call attention to the record of the thermometer on the 8th of December instant, as published in the daily newspapers: Cleveland, O., 9 below zero; Lafayette, Ind., 10 below; Coldwater, Mich., 15 below; Peru, Ind., 15 below; Lincoln, Ill., 18 below; Champaign, Ill., 12 below; Kansas City, Mo., 12 below, and Atchison, Kas., 16 below, while at Muskegon the coldest point indicated during the cold weather of that day, by the thermometer, was not quite down to zero, although within a degree of that point. The above is not an unusual instance, and it serves to explain why it is that peaches, grapes and small fruits can be grown successfully in this county. There is also fully ten degrees of difference between the temperature of the climate of this locality and that of the same latitude forty miles east. Fruits, too, are often saved in the spring and fall by the fogs of Lake Michigan, which usually extend for five or six miles along the eastern shore of the lake.

These climatic influences, and the adaptability of these sandy lands to the cultivation of grapes and of small fruits, has been fully tested, so much so that every farmer now has his field of these fruits, which usually brings him from one hundred to three hundred dollars per acre, after paying the marketing expenses. With grapes even a better result is obtained. More than this, there has been no failure within the past five years of any of these fruits, with proper cultivation. The result is that this locality is fast becoming understood as holding out the most promising inducements for engaging in these industries, and it is already recognized as being the leading strawberry locality of Michigan. The success of the cultivation of the grape is shown by the fact that there are numerous vineyards in this county which yield each from three to seventy-five tons of grapes annually.

The Chicago & West Michigan Railway, running to Chicago, passes through this county from north to south, with stations so arranged that every part of these lands is within four miles of one of them, while the Goodrich Transportation Company's line of boats to Chicago, with the smaller boats connecting, affords another very convenient and cheap means by which fruits raised in any part of the locality can be sent to market.

DISEASES OF THE GRAPE.

BY JOHN L. VAN PELT.

Twenty-four years in grape culture have taught me some strange lessons. The first year I knew all about the business. I thought that what I knew would make a large book. The second year I did not know so much, and the third year convinced me that what I did not know would make not only a much larger but an infinitely better book. I then abandoned theory and adopted practical observations; but twenty-four years is too short a time to learn all about grape culture.

Those diseases from which my vineyard suffered most were mildew, the blight, and the effects of insects. Scientists may classify differently. I have noticed all classified as rot. I take exceptions to the word

MILDEW.

Mildew is probably the most fatal disease of the grape. Its effects are almost instantaneous. When it makes a general appearance in a vineyard it is about time to bid an affectionate farewell to the crop. No crop ever survived a general attack of mildew. If the fruit seemingly survives it is only to develop into some other form of disease.

It is simply an atmospheric disease, attacking the grape during warm, damp, sultry weather, between the time the blossom is shed and the time the berry attains one-third or one-half its matured diameter. The stems of the clusters first show indications of its presence by small spots of whitish fungus, resembling a sprinkling of flour. In a few days the berry assumes the same appearance, being finally covered with white, becoming hard, and finally dropping off.

The foliage does not seem to be affected, but will grow luxuriantly. Warm rains in the latter part of May and June always gave me some solicitude for my crop. After the seed hardens there is no more danger from mildew. My prevention (there is no cure) is early summer pruning, thereby turning the flow of sap from the vine-making channel into the grape, giving it vigor and hardness to resist the attacks of mildew; also by keeping the vines open so as to admit the sun and air. I have noticed one-half of a vine attacked and the other half entirely escape. One part of a vineyard escaped while another part was almost destroyed. And I always noticed that it attacked the vines with the most foliage and heaviest crops.

BLIGHT.

Next came the blight. Why this is called a rot I cannot see. It generally made its appearance about the time the fruit passed the danger point of mildew. The berry assumes a mottled appearance, then begins to wilt and assume a sickly hue, and finally turns brown and dries completely up, very similar to the blighted pear. In low, cold, wet grounds this disease is most prevalent. Grapes are subject to it from the time the seed hardens until they change color for ripening.

The attacks are more or less virulent, sometimes destroying all on the vine attacked and sometimes only some scattering berries.

While the mildew seems to poison the sap in the stems of the clusters, the blight attacks the berry directly and the balance of the berries on the cluster are not necessarily affected unless it is a violent attack, when the berry will have an unnatural taste. This disease is accelerated largely if not often produced by decaying vegetables. Permit rank weeds to grow to a large size in your vineyard, then destroy them or kill them and leave them on the ground under the vines to decay, and I will guarantee you will not need to ask for a description of the blight, particularly if your vines are overloaded.

I have never formed a decided conclusion as to the cause of blight either in grapes or pears. Sometimes I have been inclined to attribute it to starvation of the vine, sometimes to organic disease, to the effects of mildew, to poisonous gases. Neither mildew or blight are contagious or hereditary. I shall be glad to have the opinion of those better posted on the subject. Other forms of disease that have come under my notice are those resulting from accident, such as vines changing the position of the grape bunches, breaking the stems, and otherwise injuring the berry, stings and other injuries from insects, hail, etc.

Failures to ripen the fruit are the result generally of cupidity, stupidity, or laziness in the manager. If the location of a vineyard is suitable, the vines properly planted, correctly trimmed, both winter and summer, the ground kept clean and not impoverished, the vines not permitted to overbear, but little is to be feared and much expected.

STRAWBERRY CULTURE.

BY W. M. COLLIER.

In the course of conversation at our last meeting the subject of setting strawberries on ground that had been previously set to strawberries was broached, and the general opinion seems to prevail that they will not do well.

But this is contrary to my experience and observation, although I am a firm believer in the rotation of crops and should not set strawberries on ground previously occupied by them if I had any other ground available; I should not hesitate to reset on old ground if necessary. I think one cause of failure in resetting is that generally the ground is treated with coarse, unrotted manures which are plowed under. Consequently when we have a drouth the plants suffer, as coarse fertilizers plowed under on our sandy soils have a tendency to dry them out. In my practice I never plow under but compost it and use it as a top dressing. In resetting on old ground I should plow deep and set in the spring, as generally spring setting is the most successful, and give a good dressing of well-rotted compost in the row. It answers a two-fold purpose, acting both as a mulch and a fertilizer. I think if you will treat your resetting in this way you will have no cause to complain. I know of a small plat that has been reset four times in succession, and a finer plat you would not wish to see. With proper treatment I see no reason why they will not succeed.

CULTIVATION.

In regard to cultivation there seems to be quite a difference of opinion. Some growers contend that strawberries should not be hoed before fruiting, as they consider that it injures them, but I am always willing to hurt mine all I can in that way. The only trouble that I have to contend with is that I can not give them as good cultivation as they should have. The system that seems the best adapted to this locality is in hills with all runners kept off with all varieties. On heavier soils they can be grown in matted rows with better success than they can with us here.

VARIETIES.

The variety principally grown here is the Wilson, and generally throughout the State for the Chicago market. There is quite a diversity of opinion as regards this famous strawberry, even as a market berry. Its chief recommendation seems to be that it can be picked and shipped in a half ripe condition better than any other berry grown on account of its habit of coloring long before it is ripe. Consequently it goes on the market in a very firm condition, and is suitable to reship to more distant points, which of course makes it popular both with the grower and the commission men. But from the bottom of my heart I pity the consumers that have to eat them, in the condition that they have to be put on the market. But take a thoroughly ripened Wilson, such as we are accustomed to use on our own tables at home, and I agree with our worthy president, Mr. Peck, that they are not bad to take. But what would you do with it in the Chicago market when it arrives at the stage of maturity that we would pronounce fit to eat? The report would come back to you, "All very soft," and of course it sold for about one-half the price of green Wilsons.

In growing the Wilson for market we are defrauding the consumer, not ourselves. But as long as they do not know the difference between a well ripened strawberry and a green Wilson it will be a hard task to educate their taste to something better. This constitutes the reputation of the Wilson for firmness. My observation as regards the texture of the Wilson when ripe, in comparison with several well known varieties, is strongly in its favor. Another strong point in favor of the Wilson, and which affects the grower alone, is its ability to withstand very shabby treatment and still produce a tolerable crop of fruit. It is of course very imperfect fruit, but it is the way that it is generally grown. There is no other variety that I am acquainted with that will succeed as well as the Wilson under a slipshod method of cultivation. But give the Wilson the cultivation that it should have to make it profitable and I could name more than one variety that would surpass it, even from a financial standpoint, under the same treatment. I do not speak at random in regard to this matter. It is not guess work. It is the result of practical tests in growing other varieties side and side with the Wilson under the same care and treatment. I consider that the main cause of failure of other varieties in competition with the Wilson under field culture is that they are given the very slipshod cultivation that we are in the habit of giving the Wilson, and consequently they do not succeed as well as that variety. But give good thorough cultivation to other varieties and the same to the Wilson, and market them on their merits, and you will be surprised at the result.

I have tried to give you a fair and impartial statement of the true value of the Wilson as a market berry. It is a berry that we are not willing to discard from our market list as long as consumers are willing to buy a half ripe berry, as it is not firm enough to send off after it is ripe. I am as strong an advocate of the Wilson as any one and shall continue to grow it as well as a few other varieties. The Jucunda is a very fine berry, also the Seth Boyden, Chas. Downing, and a host of others; but our home market does not appreciate the finer varieties any more than the Chicago market does.

FRUIT PACKAGES.

In referring to packages in this article, of course it will be understood for strawberries only. We should as a society and as a fruit growing community insist on the use of a standard full quart box. It does not add to our reputation in the least to use a scalper package. We are apt to think that the appearance of a package has nothing to do with the sale of fruit; that if it is fine fruit it will sell equally as well in a loosely made rough box. But in my opinion it should be our aim to place our fruit in as attractive a shape as possible. Let the boxes be made of as good material as can be obtained, and let the cases be solid and firm so that they will bear transportation, and use as good material as we can afford for a gift package. It certainly does not injure the appearance of even fine fruit to have it enclosed in a neat, well-made package.

MARKETING.

Our system of marketing could be improved upon very much. It seems to be the chief aim of nearly all fruit growers to see how many different commission houses we can send fruit to during the season. Not only during the season, but we strive to see if we have not enough cases of fruit so as to let all the commission houses in Chicago have some the same day. Right here is where we stand in our own light. For example: I have fruit on the Chicago market to-day, consigned to five different commission houses. Shippers are on the lookout for fruit that runs of an even quality to fill their orders. And the whole consignment of a grower is very apt to run pretty even, and if of good quality they would prefer buying the whole lot, providing they can find it. They find some of my fruit at one place and price it. They go to another house that I have consigned to and find the fruit held at a little higher figure than seller No. 1 holds it. "Why," the buyer will say, "I can buy this same grower's fruit at such a place for less than you hold it at." Seller No. 2 must sell at No. 1's figure or lose a sale perhaps. By spreading our fruit all over

Chicago we bring it right in direct competition with itself. Now this applies only to an individual case. There is but a small percentage of the commission houses that have a solid business reputation, and a great many that have neither reputation nor capital to lose. But we as a fruit-growing community are sending out fruit all over Chicago to seventy-five or more commission houses and putting it on the market in competition with each other. If we choose perhaps eight or ten houses that have an established reputation for honesty and fair dealing and consign all the fruit grown in this locality to them, it would give them the control of the market where now they have to unload as soon as soon as possible for whatever price they can get or take the chance of carrying some over at a sacrifice. We have too much competition in the Chicago market, and the fault is our own. I am well aware that it would be a very difficult matter to name eight or ten commission houses that would give satisfaction to everyone, as we all have our special favorites. But if we could have every fruit-grower in this locality a member of the "Muskegon County Horticultural Society," as in fact they should be, both for their own benefit as well as the benefit of the society, we perhaps could make some advancement towards a better method of marketing our fruits. What is needed is unity of action in relation to all matters that will be of mutual benefit.

WASHTENAW COUNTY POMOLOGICAL SOCIETY.

PREPARED BY JACOB GANZHORN.

OFFICERS FOR 1883.

President—J. Austin Scott.
Vice-Presidents—J. D. Baldwin, S. W. Dorr, P. L. Page.
Secretary—Jacob Ganzhorn.
Corresponding Secretary—Emil Baur.
Treasurer—E. H. Scott.
Executive Committee—J. J. Parshall, Wm. McCreery, Chas. H. Woodruff, O. R. L. Crozier.
Climatologist—Dr. Alex. Winchell.
Botanist—Prof. Volney Spalding.
Ornothologist—Prof. J. B. Steere.
Hygienist—Dr. A. B. Prescott.
Entomologist—D. J. Higly.

List of Members for 1882—F. B. Braun, J. J. Parshall, E. H. Scott, W. F. Bird, Emil Baur, C. H. Woodruff, N. B. Covert, Benj. Day, E. A. Spence, John Allmand, P. L. Page. S. Mills, Dan'l Hiscock, C. R. Gardner, B. E. Nichols, G. F. Allmendinger, Jas. D. Duncan, E. Popkins, Wm. McCreary, Frank Parker, M. S. White & Co., I. N. S. Foster, Jos. Whitlark & Co., John Mead, H. Briggs, E W. Coddington, John Williams, John W. Williams, N. Sheldon, H. Sessions, John C. Bird, Mrs. Lucy Whitlark, E. A. Nordman, Felix Donnely, O. F. Webster, J. E. Sumner, Wm. Warner, Chas. Conrath, John Donnely, Jacob Ganzhorn, S. W. Dorr, J. A. Scott.

Honorary Members—Dr. Alex. Winchell, Dr. A. B. Prescott, Prof. V. M. Spalding, Prof. J. B. Steere, D. J. Higly.

The fruit crop for 1882 was good, excepting the apple. The Baldwin, of the latter, yielded best; in some orchards yielding a full crop. Prices of all fruits ruled well, or satisfactory. First-class apples sold at $2 per barrel, buyers furnishing barrels and doing the packing. The peach interest keeps spreading and continues to overshadow all other fruits. The orchards which had the best air-drainage yielded the best crop; others suffered to some extent from the severe late spring frosts. First-class peaches sold for $1.50 to $3.00 per bushel. Late peaches brought the latter figures. Pear growing is increasing; bearing trees bore well. The fruit of the Flemish beauty was nearly all destroyed by cracking, caused by the excessive wet weather in July. First-class pears sold for $2.00 and upwards per bushel. Sweet cherries were injured by the spring frosts; the sour kinds yielded about a half crop. Price of the latter, $2.50 per bushel.

Grape growing is steadily increasing; it is mainly spreading among farmers, who plant for their own use. The writer of this has eight acres planted, and intends to keep adding from time to time. The Concord is the only grape attempted to be grown for the market. The grape crop was very large, but below an average in quality on account of the low temperature and excessive wet weather in mid-summer. Prices ranged from three to five cents per pound. The The small fruit interest is becoming an important one, and its cultivation is rapidly increasing. The Cuthbert is the favorite red raspberry. The Gregg is largely planted for a black raspberry. The Snyder leads the blackberry family and the Wilson still "holds the fort" in the strawberry line. Prices ranged from ten cents to twenty cents per quart. Quinces are grown in moderate quantity, but are always salable at from $1.50 to $2 per bushel.

A valuable paper was read before the society by Dr. A. B. Prescott, of the State University, on The Artificial Preservation of Fruits, in respect to their food value, an abstract of which is appended.

The society devoted considerable time in an effort to create or establish a stock company for the preservation of fruits; but after much labor expended in canvassing the matter by committees, it was found that no organization could at present be effected. Nevertheless, the work in this direction was not altogether in vain. Individual members have gone into the business, and thus far their labor is in the way of experimenting, though much good to the community is expected to result from their enterprise. J. D. Baldwin is leading in this line, and he spent about one thousand dollars in canning jams, jellies, marmalades, etc., etc. S. W. Dorr, a former president of this society, has in successful operation a house for keeping apples. Discussion on peach packages has taken up considerable of the society's time. Crates are favored by many. Shipments in these packages will likely increase. Bushel baskets are now extensively used. The small baskets run all the way from full pecks down to three quarts; the latter size are much liked by a number of large peach growers.

Transportation formed a large part of the discussions. A standing committee composed of the most energetic peach men, and who were largely interested in shipping, was kept canvassing the matter and negotiating with forwarding companies. The effort resulted in securing daily peach cars attached to the fast express trains during the peach season.

Prof. V. M. Spalding, of the University, gave the society an interesting lecture on Diseases of Trees and Shrubs, which is appended to the report.

SUMMER PRUNING.

At the July meeting there was a beautiful display of strawberries, and the above topic was discussed.

Jacob Ganzhorn said that by summer pruning it was aimed to increase the size of the fruit; to mature the new wood for the winter. The productiveness of the strawberry plant is increased by keeping its runners cut from time to time; by this process crown upon crown is added. In the raspberry and blackberry the new growth is pinched in to concentrate the bearing wood, and to admit a free or open passage between the rows for cultivation and ease in gathering the fruit. The black-caps require more pinching than the red raspberries, and the latter according to the vigor of the variety. He also recommends the thinning of the canes in the latter class in order to secure well ripened wood. The weak growing varieties require no further pruning than thinning out the new canes.

In grapes, the young vines should have the new growth concentrated to from one to three canes, according to the vigor of the vine. The bearing vine should have all new wood taken out that is not bearing fruit, or is wanted for the next year's crop. The bearing canes are cut back to within one to three leaves of the last bunch. Over-bearing should be prevented by thinning out the small bunches. No fruit is more permanently injured by over-cropping than the grape. Light, and a free circulation of air, he regards indispensable to good fruit and new woods, and the amount of pruning should be sufficient to secure this end, and no more.

The young peach tree, before it is in bearing, when growing vigorously, should have the leading branches cut back a little to induce the proper ripening of the new wood. The work is begun in mid-summer and may in some cases be kept up until fall. Bearing trees usually ripen the new growth without the aid of summer pruning.

A proper development of the forming heads on young trees should be looked after from time to time during the growing season. Apple and pear trees which were pruned in the spring should have the forming suckers broken off from time to time as they appear.

President Scott thought the latterals of the raspberry ought not to be pinched.

Prof. Emil Baur believes that in this latitude the raspberry had better not be pruned a second time in the summer.

The society devoted a meeting to the law concerning trespassers, which resulted in the appointment of a committee to confer on this matter with the State Horticultural Society, with the view of obtaining a more stringent law from the incoming Legislature so as to protect the fruit interests more fully. P. L. Page, O. R. L. Crozier and Hon. Charles Richmond are the members of the committee.

Cultivating and seeding down orchards was discussed during one of our sessions. The fruit men are somewhat divided on this subject. J. D. Baldwin follows thorough cultivation till mid-summer. O. H. Kane claims he grows good peaches by very little cultivation.

Jacob Ganzhorn said that the amount of cultivation necessary to grow fine fruit varies with the altitude of the ground and character of the soil. A high and rolling piece of ground requires more cultivation of the soil to keep fruit and trees growing than low or level ground. Rich soil requires less stirring than poor soil.

S. M. White said that he judges from the appearance of the new growth when and how much to cultivate.

President Scott, in regard to seeding down, said that he meets with good results by mulching around the trees, with the grass cut between them, in the growing season.

Emil Baur does not like to seed down with clover ; he fears the grasshopper as a consequence.

Fall planting of the hardy fruits was recommended. The planting of stone fruits had better be deferred until spring.

THE ARTIFICIAL PRESERVATION OF FRUITS IN RESPECT TO THEIR VALUE FOR FOOD.

BY ALBERT B. PRESCOTT.

[Abstract.]

Let us consider (1) the principal plans adopted for the preservation of fruits, and (2) the effects of these plans upon the value of fruits.

The methods of preservation may be mainly classed under the following heads:

1. Boiling the fruit, usually with addition of some sugar, and sealing up while hot, for exclusion of air, in vessels of glass or tin. "Canned fruits." No way of excluding the air and keeping the fruit, without boiling, has been found successful. Indeed, such brief boiling as might serve only to exclude the air proves insufficient, and the fruit constituents have to be cooked, that is, modified by exposure to heat, in order to insure their preservation. Therefore this method results in the preservation of food prepared by cooking fruit, rather than in the preservation of fruit itself.

2. Drying, in the air or in partial vacuum, at ordinary or moderately elevated temperatures. As the injury to the fruit is in proportion to the exposure to air, and to the elevation of temperature, the best results will be attained by dryness of the air, by rapidity of the air current, and by diminished air pressure. A brief exposure to warm air causes less injury than a long exposure to cool air, but the temperature must be kept below the cooking point in all cases. It would be one way to apply a rapid current of dry air at about 130°F; and another way to maintain a partial vacuum at the same temperature. Air may be dried by drawing through ice-cold passages until it deposits its moisture, or by passing over quick-lime, chloride of calcium, or other material absorbing moisture. Quick-lime would be afterward used as slaked-lime; chloride of calcium would, dried in the furnace, do to use over again.

3. Saturation with sugar, in a syrupy liquid or in a moist solid. Fruits already contain sugars, and the more richly saccharine they are, the more easily are they preserved by drying. Some grapes contain so much sugar that that they are preserved almost unwilted by the imperceptible concentration of their juices effected in ordinary keeping in the air. By a little further drying they become raisins. When dilute, a solution of sugar is not a preservative, but a subject of fermentation. There should be from one and a half to two parts of sugar to one part of water, to secure preservation. Grape sugar, or glucose, is not so good a preservative as cane sugar. In canning fruits, as above given under method 1, the preservative power of sugar is generally a partial reliance. When to be kept in the air, the sugar is applied as a preservative, either along with cooking, as in the jams, jellies, and old time syrupy "preserves," or along with partial drying, corresponding to that of figs, raisins, and fruits "dried in sugar."

4. The use of antiseptics. These agents have never been generally employed for the preservation of fruits. Meats are salted for extensive use, but the use of preservatives other than sugar, for the keeping of fruits, has not gone beyond the stage of experiment. A few substances have been tried as such preservatives. Some years ago the writer saw a jar of pears, uncooked, immersed in a solution of sulphurous acid. The jar had been stoppered but not sealed, and the fruit, which was pared, was really quite fresh, having been so kept for several months. The liquid smelled strongly of burning sulphur, and tasted astringent and somewhat acidulous, and contained sulphuric acid. The astringent taste was perceptible in the fruit as well. Very lately a member of this society presented to the writer for analysis a sample of an article absurdly entitled "ozone," consisting essentially of sulphur to be burned and so applied as sulphurous acid in vapor.[*] Sulphurous acid is the opposite of

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[*] "A box containing one pound of a black powder, tasteless, insoluble in water, of a slight aromatic odor, and sold for two dollars, by the Prentis Preserving Co., limited, southeast corner Ninth and Race streets, Cincinnati, Ohio. The label states that this preservative is not any of the old exploded processes, but is simply and purely 'Ozone;' also that there is nothing on the face of the earth which ozone, the new preservative, will not preserve for all time in a perfectly fresh and palatable condition. The directions state that the powder is to be ignited and allowed to

an oxidizing agent, and the most of its influences are the opposite of those of ozone. Moreover ozone is not a preservative, so that this trade-name, ozone, is adopted with no regard to the use of the chemical term. Sulphurous acid is a most potent antiseptic and preservative, of use as old as history. Its salts, the sulphites, are employed to prevent the fermentation of cider. It is cheap enough, a pound of sulphur at three or four cents furnishing sulphurous acid enough for the treatment of hundreds of pounds of perishable material. There are three difficulties, however, in the way of its success in preserving fruits. *First*, if not confined in strictly air-tight vessels it escapes and leaves the fruit to decompose as surely as though it had not been applied. *Second*, if air is not excluded it oxidizes to sulphuric acid, nearly valueless as a preservative, and the fruit is left unprotected. *Third*, while the sulphurous acid is retained its suffocating vapor is both offensive and hurtful, its oxidized product is astringent, disagreeable, and unsuitable to food, and it is hardly practicable to expel it so as to avoid its oxidation. Another agent which has been tried in the preservation of fruit is borax. It is a potent preservative but probably cannot be taken in concentration sufficient to be effective without being objectionable to taste and health. Still another, and perhaps the most promising preservative is salicylic acid, much praised for keeping milk and other foods,—an agent that does not vaporize, can be taken in considerable quantities with but little effect on the system, and is not very expensive. There is, however, a lack of evidence that it can be used properly to keep fruits.

In considering the influences which preservative methods have upon the value of fruits, we should bear in mind the following named constituents:

a. Sugars and starch products (common to other vegetable foods).
b. Pectous substances and gums.
c. Acids, tannin, glucosides.
d. Ethers and other flavoring substances.

In cooking, all of these substances are altered, and the ones most distinctive to fruits are so changed as to no longer retain the especial value of fruit as a promotive of digestion and a nourishment to the body. The pectous substances lose no small share of their distinctive service, as antiscorbutics, and promoters of nourishment, in being cooked. Acids are modified less seriously; but they suffer alteration. Flavors are driven off. Cooked fruit in some respects corresponds to over-ripe fruits.

The changes in drying, if it be done rapidly, with brief exposure to air, are not so generally injurious as in cooking, but are still hurtful in some degree. The flavors are dissipated, and the pectous substances, frail and alterable as they are, after drying, refuse to resume their exact previous state. With long exposure to air the changes of over-ripening and incipient decay are obtained. But it should be admitted that fruits rapidly dried at low temperature present many claims to comparative favor.

The effect of sugar added to preserve fruits is not objectionable, unless it becomes an objectionable article in itself. Sugar does not neutralize or modify the acids, nor does it cause chemical changes of the other constituents. But sugar is in itself a heavy article of diet, not by any means always favorable as an accompaniment of fruit. If the sugar is desired as an addition, it is very

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burn on a plate in a closed and air-tight barrel, box, or compartment containing the articles to be preserved. It will burn until the articles are fully preserved, when it will stop burning of itself, so that what is left can be used again. Upon analysis I find the mixture to consist of three parts of sublimed sulphur and two parts of powdered charcoal, with a very little ground cinnamon." —[From report of A. B. Prescott in Detroit Post and Tribune, December, 1881.]

well; but the alternative to have fruit heavily sugared, or not to have it at all, is an alternative that it were well to be relieved from.

The antiseptics, for the most part, exert little change upon fruit constituents, and no serious objection lies against their use on this ground.

Fruit constituents are frail and delicate compounds. Nature has presented them in harmonious and favorable proportions. None of the methods of preservation above considered leaves the integrity of the constituents, and the proportion of their quantities fully unimpaired. Nevertheless, some of these methods of preservation, when well executed, furnish valuable foods, slightly modified from fruits, but well worthy of a high place among nourishing and grateful articles of diet.

There yet remains to consider, regarding the so-called canned fruits, the liability of injurious contamination by the material of the vessel. It is only the tinned articles which suffer this liability. The acids of fruits have a degree of solvent power upon tin. Wherever the sheet-iron basis is exposed, the tin is more rapidly dissolved, and some iron is also dissolved. Several chemists have made series of analyses of tinned canned goods, and the reports substantially agree that the majority of the cans contain some dissolved tin, and a small proportion of the cans contain enough dissolved tin to affect the taste and to be a matter of inquiry regarding the influence upon the human system. There is no reason to regard tin as a cumulative poison, like lead, and there is nothing known as to the effect of taking continued minute portions. In large quantities, dissolved tin is an acute poison. There is little doubt, however, but that dissolved tin is an unwholesome, as well as a disagreeable addition to human food. If tin must continue to be used, the best of tinware should be employed, and the goods should not be kept for years, but provided for early use.* Lead has not been found, though searched for, in canned goods.

DISEASES OF TREES AND SHRUBS OCCASIONED BY VEGETABLE PARASITES.

V. M. SPALDING.

In attempting to give an account of those diseases of trees and shrubs that are traceable to the influence of vegetable parasites it is hardly necessary to state that we are dealing with a subject that in some of its aspects at least is still imperfectly understood. It is this very fact however that ensures the continued investigation of the diseases, and it is hardly to be regretted that some such cause still remains to compel attention to the most insidious and persistent enemies of the cultivator of trees and fruits. It will prepare the way for our study of the subject to glance first at a few of the most prominent characteristics of the fungi, the great division of plants to which most of these parasites belong.

Fungi include all those peculiar organisms popularly known as mould, mildew, rust, smut, blight, and the more conspicuous, but to the fruit-grower much less important, forms, called mushrooms, toadstools, and puff-balls. They are all of vegetable origin and therefore proper subjects of botanical study and classification. They differ from nearly all other plants in having no chlorophyll, the substance that gives to leaves their green color and enables plants that contain it to elaborate their own food from the mineral constituents of the atmosphere and soil. The fungi, being destitute of chlorophyll, are under the necessity of obtaining this food already prepared for them wholly or in part by other plants, and accordingly we find them either growing upon living plants or animals as parasites, or they fasten upon and gather nutriment from dead animal or vegetable material. The peculiar structure of the fungi adapts them for their parasitic habits. They are made up of long, irregular, often interwoven threads or tubes that work their way through the tissues of the plant or animal substance upon which they live, and in many cases are provided with curious suckers which aid still further in abstracting the juices of their host, as the organism upon which they feed is called. These tubes are thick-walled, firm, and tough, and as a rule are much less easily injured than the cells of the plant in which they are growing, a fact that renders it all the more difficult to destroy the fungus without seriously injuring its host.

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* See report of G. L. Palmer, in contributions from chemical laboratory of the University of Michigan, p. 23. Also, an article by A. B. Prescott, Sanitary Engineer, 1882, Nov 16, p. 515. Further, a summary by Otto Hehner, the Analyst, London, vol. 5, p. 218.

After growing for a longer or shorter period in this way, at the expense of the plant or other organic material upon which it has fastened, the fungus produces an abundant crop of spores (corresponding to the seeds of flowering plants), and in this way secures its own multiplication and the continuance of the mischief of which it is the cause. To render the perpetuity of their kind doubly sure, nearly all fungi produce at least two kinds of spores, and some of them as many as three or four, of different forms and sizes. Some of these are small and light, and are borne away by the wind to other individuals of the same host, upon which they grow immediately; others are large and hard, covered with a firm wall for resisting all extremes of temperature, and in this way their growth, after the vicissitudes of winter, under the returning warmth of spring, is provided for. Then, as if to successfully elude the search of man for his minute but effective enemy, some of these germinate and grow on plants totally different from the one on which the fungus began its development, and assume a form that would not be suspected of having the remotest relationship with its earlier stages. Living in this way for a time upon its new host, it at last returns to attack in its original form the plant with which it started. Add to all this the immense number of species, some thousands of which have been enumerated as occurring in the United States, and no surprise need be felt that the fungoid diseases of trees and other plants are not all known and the means of their extermination pointed out; indeed, it is a matter of congratulation that so considerable an amount of information concerning them has already been accumulated.

In the present state of our knowledge, it is desirable to point out briefly the most important facts now definitely established respecting the influence of fungoid parasites upon trees and shrubs, and at the same time to call attention to such unsettled questions as are specially worthy of further investigation. For the sake of clearness the several classes of fungi will be considered in order.

THE BROWN MOULDS.

The interesting class of fungi known botanically as the Mucorini, and commonly called "brown mould," may be dismissed at once from our present consideration, for the reason that they never grow upon trees, nor, in fact, upon any living plants. They grow upon dead or decaying animal or vegetable material, and especially upon articles of food that have been allowed to stand in a damp place, covering it with their fine white filaments and brown or black spore-bearing heads. Though often troublesome intruders when they fasten in this way upon our stores of provisions, the brown moulds are really friends in disguise, acting as so many scavengers to clear away material that would otherwise become unwholesome.

THE WHITE MOULDS..

A second class of fungi includes the white moulds that are found in the form of delicate tufts of fine white filaments, chiefly on the surface of leaves, but not uncommonly occurring on the fresh shoots and other green parts of living plants. Some of the most destructive fungi are included in this class, known by the scientific name *Peronosporeæ*, among which may be specially mentioned the potato fungus that from time to time has been the occasion of the loss of the potato crop in Ireland; the onion mould, sometimes very common and destructive to young onion plants; another species growing upon and destroying cultivated turnips, and still others on parsnips, peas, and other crops. The single species occurring in this country upon a woody plant is *Peronospora viticola* or the grape-vine mildew. The fungus in question appears on the under surface of grape leaves of both indigenous and cultivated species as a fine, white, frosty-looking growth, recognized under the microscope as a multitude of delicate filaments producing at their tips an abundance of spores. The spores readily germinate under proper conditions of warmth and moisture, and thus secure the rapid multiplication of the fungus and consequent spread of the disease. Later in the season, larger and darker colored spores with a thick wall are produced inside the tissues of the leaf and fall with it to the ground in the autumn. Under the influence of the fungus the leaves dry and curl up, become discolored and brittle, and though they remain upon the vine for some time, they are unable to perform their proper functions of respiration and assimilation. The fungus, therefore, is the exciting cause of an unhealthy or diseased condition of the vine, and should be treated as such. It appears that no great amount of injury has yet been reported from its presence upon grape vines in the United States, but it has already proved highly injurious to American vines cultivated in Europe, and especially in Algiers; and according to Dr. Englemann it has occasioned some trouble in Missouri, where it begins early in the summer and attacks not only the leaves, but the young berries and their stems. It occurs quite commonly at Ann Arbor on both cultivated and wild grape vines; but there are no reports here of its having been the occasion of any injurious effects. The fact that the resting spores which carry the fungus through the winter are produced within the tissue of the leaf, and remain there until set free by its rotting or cracking open, suggests the gathering in the autumn and burning of the leaves of all vines that have shown the presence of the disease, as being the most certain means of preventing its spreading the following year.

A disease known as "grape rot" has in some years prevailed extensively on the islands in Lake Erie, comprising Put-in-Bay township, lying to the eastward of Toledo, and has also been reported in Southern Michigan. According to the statements of those who have had most experience with the disease, it never occurs except with low state of barometer and humid atmosphere. The berry, which is attacked "at any time from the blossom well up to maturity," presents at first a grayish, mottled appearance, and afterwards becomes black and rotten. The disease is reported as sometimes occuring half a dozen times during the season, and uniformly in "muggy" weather. "The section of country between Sandusky and Cleveland was visited by numerous showers between the 10th and 25th of July, 1879; the consequences were, that they lost nearly their entire crop of Concords as well as Catawbas." These descriptions, and others that have been given, indicate the presence of a fungus; it does not appear, however, that its accurate determination, based upon microscopical examination, has been made. According to Mr. Townsend, of Isle St. George, pure flowers of sulphur, mixed with finely ground land plaster, one-third sulphur to two-thirds plaster, applied with a bellows every two weeks, is a complete preventative of the disease. Others have found little manila bags pinned over the clusters of grapes an efficient protection.

A number of other fungi occur in this country upon both cultivated and indigenous grape-vines, all requiring more thorough investigation of their nature and habits. It is desirable that specimens intended for microscopical examination should be gathered in different stages of the disease, placed at once in alcohol, and properly labeled. In this way the fungus can be examined and its identification attended by much less liability to error than when dried specimens only are sent.

RUSTS AND SMUTS.

To another and very different group of fungi belong a large number of species popularly designated as "rusts" and "smuts." They ought, perhaps, to be placed under two separate classes, and, in fact, are usually classified in this way, under the distinct names of Uredineæ (rusts) and Ustilagineæ (smuts). The former include the rusts on wheat, raspberries, and a great variety of cultivated plants, appearing early in the summer as bright red or orange spots made up of a multitude of dusty high-colored spores, and later in the year as dark brown or black spots whose spores are less easily detached, and when examined microscopically are seen to have the hard, dark-colored, firm, cell-wall that is characteristic of resting-spores. These, as in the case of the resting-spores already described as occurring in the grape leaf, remain through the winter in the stem or other part of the plant where they are produced, ready to germinate in the spring. Although the species of rusts are very numerous and conspicuous, a comparatively small number attack shrubs or trees, by far the greater part being found on the stems and leaves of herbaceous plants, many of which are greatly injured by their presence.

The rust on wheat is of great practical interest as seriously affecting our most important grain crop. For this reason it has for many years been the subject of special study on the part of botanists, and the general facts of its life history are believed to be established with a fair degree of certainty, though they have been the occasion of much dispute, even down to the present time. According to the observations of those who have studied the subject most carefully, the rust on wheat is only one stage of development of a fungus that lives a part of the year on wheat and other grasses, while in another stage of growth it appears on the common barberry, a shrub that has been introduced into this country from the old world and is now widely distributed through the older portions of the United States. The familiar form of the rust seen at harvest time is succeeded by the resting-spores of the same fungus which appear at the surface of the stalk in late summer and autumn in slender black lines that can be seen by examining the straws on almost any piece of stubble or in the straw-stack. These resting-spores remain dormant through the winter, ready to germinate under favorable conditions in the spring. In germination they produce numerous small, light bodies that are borne by the wind or other agencies to the leaves of the barberry. The fungus now grows for a time in the barberry leaf and then breaks out on its surface in the form of slender, conical bodies of a yellowish color, filled with numerous light spores which, upon the rupture of the sac containing them, are borne away by the winds, it may be for many miles, and, falling upon wheat or other grasses, germinate and produce the rust again. This curious change of hosts, first the wheat, then the barberry, and finally the wheat again, is repeated from year to year, the barberry apparently being an essential factor in the process without which the rust would fail to maintain its succession of generations. Strange and even improbable as this succession of different generations on such widely different plants may appear, it is nevertheless accepted as the veritable history of this fungus by highly competent scientists, and recent experiments go far to confirm their belief.*

Still it must be remembered that in such an inquiry mathematical demonstration is out of the question, and every additional fact tending to throw light upon the question, in whosoever possession it may be, ought to be recorded as contributing to a more perfect knowledge of this difficult subject. The practical bearing of the case is at once apparent. If it is admitted that *Puccinea graminis*, the wheat rust, is simply one of the stages of *Æcidium berberidis* the barberry fungus, we have a comparatively worthless shrub growing far and wide over the country, slightly diseased from time to time, and communicating this disease in an altered form to the wheat crop, and the fact that scientific evidence accumulated through many years points to this conclusion should be sufficient to lead to the extermination of the common barberry.

A red rust, *Uredo luminata*, frequently occurs upon the leaves of raspberry bushes, both wild and cultivated, and has sometimes been so prevalent as to seriously injure the plants affected by it. The botanist of the State of New York in his report for 1874 mentions the fact of its rapidly becoming a pest to the cultivators of blackberries and raspberries. It is not uncommon in Michigan, though I am not aware that it has yet proved particularly destructive here.

Another rust, *Melampsora populina*, occurs on the leaves of different species of poplars, breaking out in orange yellow spots which afterwards become dark brown or nearly black. It is said to have done much injury to cottonwoods in the west, particularly in Iowa. Still another species of rust known as *Æcidium pini*, attacks the young plants of Scotch pine and other species of pine in nurseries, and sometimes occasions much damage.

As for the treatment of plants affected by any of the different rusts, it is probable that flowers of sulphur, prepared and applied in the way already described, would prove a satisfactory remedy. In those cases where the resting-spores remain in the leaf and fall with it to the ground, the gathering and burning of the fallen leaves in the autumn would be a useful precaution against the further spread of the disease the following year.

The smuts previously mentioned in connection with the rusts are nearly all parasitic upon herbaceous plants. Corn smut is one of the best known, and the smut of wheat, oats, and barley will also occur as familiar examples. They

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*Experiments conducted during the present year in England, are thus described by Mr. C. B. Plowright, the gentleman by whom they were carried on: "This year another series of cultures was instituted, in which the promycelium spores of *Puccinia graminis* were sown upon young barberry plants with the unvarying result of producing the Æcidium, the check plants remaining free from the fungus. Young wheat plants, which were kept continuously covered by bell glasses from the time they were first sown till the experiment was concluded, were also found when infected with ripe *Æcidium berberidis* spores, to become infected with Uredo, while similar plants, not so infected, remained healthy."—[Grevillea, September, 1882.]

are highly injurious to the species upon which they grow, and in some instances have almost entirely destroyed crops infested by them, as happened some years ago with the onion crop in portions of Connecticut. Gathering and burning the affected plants would, if it were practicable, be the most effective means of checking their ravages, and in the case of corn smut, which in some localities is becoming a serious pest, this could be done without great expense. As very few of the smuts have ever been reported upon woody plants they may be passed without further notice.

BLIGHTS OR WHITE MILDEWS.

Still another class of fungi includes a multitude of species, some of which popularly called "blights," have proved highly injurious to a number of our most important fruit-bearing trees.* The white mildew on cherry and apple leaves, *Podosphæra Kunzei*, is of common occurrence in Michigan, and is the cause of much injury when it attacks seedlings in nurseries. It covers a large part of both the upper and lower surfaces of the leaves with its white filaments, smothering and choking them, and in this way interfering with the normal growth of the young trees. The mildew of gooseberries, *Sphærotheca panosa*, was observed in the summer of 1881, growing abundantly on wild gooseberries at Old Mission, near Traverse Bay. The fruits were covered with its brown felted threads and were rendered nearly or quite worthless as the result of its attack. I am not aware of its occurrence on cultivated gooseberries in this State, but have seen it growing so abundantly upon them in Central New York as to seriously damage the crop. What is believed to be an earlier form of the same fungus is of very frequent occurrence on the leaves of cultivated roses, often proving a great pest in conservatories. The proprietors of the greenhouses in Ann Arbor hold it in check by the prompt application of the flowers of sulphur, a fact that suggests the value of the same remedy for the blights of cherry and apple trees and other plants infested by them. A great number of forest trees and various cultivated trees and shrubs, among them the oak, elm, willow, horse-chestnut, lilac, and others, are attacked by blights, sometimes without apparent injury, though it cannot be doubted that in all cases the growth of these fungi interferes to a greater or less extent with the vital processes of the leaves which they cover and partially choke, besides abstracting their elaborated nutriment. Wherever the disease is limited in the extent of its ravages, as in the case of roses or gooseberries and young apple and cherry trees in nurseries, the remedy already suggested will doubtless prove prompt, effectual, and econonomical.

THE BLACK KNOT.

To the same general class with the blights, though differing from them greatly in appearance, belong an immense number of fungi, of a hard texture, dark color, and often conspicuous size. Many of these grow upon decaying wood, fallen twigs, dead leaves, and the like, and are of little practical interest except in so far as they perform the office of scavengers, hastening the processes of decomposition and removal of waste material. Some of them, however, attack living plants, and one in particular, very commonly met with in Michigan, is of special interest as being the occasion of the disease of plum and cherry trees known as "black knot." This peculiar excrescence has long been known and by early writers was variously referred to the action of insects, or the combined action of these and some fungus growth. The first to give a complete description of the knot and the fungus by which it is caused was Dr. W. G. Farlow, Professor of Cryptogamic Botany in Harvard University. The admirable account of the disease given by this author is too extended for anything more than a brief reference. Its destructive influence is shown by the fact that in many localities in the Northern States plum trees have been completely ruined by it, while "in some parts of New England, particularly in Maine, and along the sea-coast, the raising of cherries has been almost abandoned in consequence of the ravages of the black knot." In Michigan it is most frequently met with on cultivated plum trees. At Ann Arbor it is abundant on wild plum trees and near Grand Haven specimens were noticed in the summer of 1882 growing on the choke cherry. I am not aware of its occurring with us on any other trees. Its propagation is secured by the production of several kinds of spores, one sort being produced from spring to the latter part of summer on exposed parts of the knot where they can be carried away readily by the wind or birds or by other agencies. The perfect resting-spores (with some others whose subsequent history is less known) reach maturity in the middle of winter, ready to be disseminated in like manner when the knot becomes hollow and broken, as is the case with old specimens.

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* Pear "blight" does not belong to this class. It will be considered further on.

The occurrence and method of reproduction of the black knot suggest (1), That when it has attacked a cultivated plum or cherry tree, the only remedy is to cut away altogether the limbs upon which it is growing and burn them; (2), That the wild plum and the choke cherry upon which the knot grows are a nuisance and ought to be exterminated in order to prevent the spread of the disease from them to cultivated trees. The removal of the wild plum trees covered with knots that are now standing half a mile below Ann Arbor near the left bank of the river, certainly comes within the authority of our officials, and might properly receive their attention. Doubtless our worthy Secretary has already noticed the knots that are growing luxuriantly on the plum trees on his new place, and will take care of them as soon as he gets settled.

MUSHROOMS AND TOADSTOOLS—DRY ROT.

The large class to which the more conspicuous fleshy fungi belong, such as the "mushrooms" and "toadstools," derives its chief economical interest from the edible properties of some of its species and the poisonous nature of others. Still there are at least two species; that from their connection with the disease known as "dry rot" in timber, deserve special mention here. These two are named respectively *merulius lachrymans* and *polyporus hybridus*. Like other fungi they grow best when their surroundings are warm and moist, and accordingly are of more frequent occurrence in the moist climate of the British islands than in the United States. Still the dry rot is by no means unknown in this country. A few years ago Mr. E. L. Jenney, then Professor of Architecture in the University of Michigan, brought to Ann Arbor specimens of wood from some of the large beams in the Portland block in Chicago that were entirely ruined by the dry rot. The fragments which he brought were of a dull brownish color, looking some as though they had been subjected to the action of intense heat and crumbled beneath the touch. Microscopic examination showed the fine white filaments of the fungus that was the occasion of its diseased condition ramifying through the substance of the wood. Without going into complete details, it may be stated that the great cause of dry rot, whether in oak or pine, is imperfect seasoning and exposure to a damp atmosphere. If it were possible to thoroughly season all timber employed in building, and then to secure a uniformly dry atmosphere, there need be no trouble from dry rot; but as these conditions often cannot be perfectly met, various processes have been devised for the preservation of timber. Coal tar, corrosive sublimate, sulphate of copper, sulphate of iron and numerous other preparations have been employed with variable success. A late writer concludes a treatise on this subject as follows: "In conclusion, we can only summarize our remarks on the cause of dry rot by saying, season and ventilate, in every case; as to the cure that is not so easy to deal with;" another fact going to show that diseased trees and diseased timber have much in common with diseased humanity, in whose case prevention is of most importance since "the cure is not so easy to deal with."

BACTERIA.

There remains for our study a single class of vegetable organisms, the Bacteria, that within a few years have become famous for their now demonstrated connection with fermentation, putrifaction, and disease. Some of the best known of these "lowest forms of life" are certain species that uniformly accompany, and are believed to be the active cause of splenic fever, fowl cholera, and certain other diseases. By the experiments of Pasteur, Koch, and a few other investigators, the real nature of these deadly germs and their connection with the diseases mentioned have been clearly pointed out, and the nature and control of contagious diseases in man and the higher animals are becoming more and more a matter of exact scientific knowledge. Very recently the attention of vegetable physiologists has been directed to organisms of apparently the same nature that occur in great numbers in the tissues of blighted pear trees and in other diseased plants. Prof. T. J. Burrill, of Illinois, reports the presence of these organisms, not only in pear trees affected with blight, but also in various other trees similarly diseased. These later investigations have been carried on so recently that it is impossible, as yet, to know just how much significance to attach to them, and there is need of their confirmation on the part of competent observers. Should the announced discovery be confirmed, it will throw much light on some of the most insidious and fatal diseases to which our cultivated fruit trees are subject. Meantime, in view of the striking results that have been attained in the old world through the experimental study of disease germs, it will hardly be thought fanciful to say that in the same line great possibilities are suggested in relation to the protection of fruit trees against diseases of similar origin. If a chicken can be protected against fowl cholera by vaccination, why may not a pear tree be secured against blight, and a peach tree against the yellows by the same means?

LENAWEE AND HILLSDALE HORTICULTURAL SOCIETY.

PREPARED BY GEO. D. MOORE, SECRETARY.

OFFICERS.

President—J. U. Harkness.
Secretary—Geo. D. Moore.
Treasurer—R. H. Rodgers.

It will be impossible to make a very satisfactory report since uniting with the State Horticultural society. Since that date (April) we have held four meetings, and several interesting discussions have taken place on horticultural topics. Two essays I append to this report containing points worth saving:

The taste for horticulture and pomology has greatly improved the last few years within the jurisdiction of our organization, and a growing interest is yearly manifested by the taste displayed in the ornamentation of homes and the waysides. Our annual election occurs the second Tuesday in January. A new force of officers will undoubtedly give new life to the society, and in the future make the Union more worthy of a connection with the State Horticultural society, than it has been in the past. There are 27 names on the roll, and it is hoped with the new year that all will renew their membership and that many new members may be added.

SMALL FRUIT CULTURE.

BY V. WENZEL.

In discussing this subject, I need not tell you how pleasant and delightful it is to have our tables plentifully supplied with strawberries, for you all know that large, nice berries, fresh from the vines, with sugar and cream, are not hard to take. If the farmers' tables of our land were better supplied with fruit, and less with greasy pork, we should have less scrofula, and have better health.

Strawberries, raspberries, currants, blackberries, and grapes will supply the table from June until frost and snow come, fresh from the vines, and with the good housewife's care, the table after this season may be supplied with canned fruit and jelly—and with plenty of vegetables from the garden, less bills will be paid for groceries and meats.

Many of our farmers' wives and daughters, too, will ramble over fields and climb fences after wild berries, and spend a great deal of time and hard work, and often get more scratches than berries—and the berries have more seeds than flesh—when they might just as well, with less labor, cultivate a few rods of berries at home, and have all the fruit their hearts could wish.

Now the question, "Why is it that there are so many farmers that are not supplied with these comforts and luxuries of life?"

One will say, "I have no time; too much other work to do." Well, it will take no longer to plant a patch of berries than it will to plant a patch of potatoes, and with proper care the berry patch will last a number of years, and the same ground that will bring good potatoes will bring good strawberries and raspberries. No one thinks he has not time to plant potatoes.

Another one says, "I do not know how to raise them; I have tried and failed." Perhaps you did not take the right way. I will give you my experience and practice, and you can take it for what it is worth. I have raised small fruits of all kinds for a number of years, and have been reasonably successful, and if you will follow my advice and practice, I think you will succeed. I prefer planting in the spring, as early as the ground is fit. I plow the ground deep, pulverize it well, have the ground moderately rich—not too rich—then mark out the rows three and one-half feet apart; and now I am ready to plant, and here comes the most important part of the whole business, to plant the right kind of plants, and here is where so many fail. Some men say one kind will do as well as another, and they get some worthless plants that are run out and badly mixed, and the result is they get no fruit, or at least only half a crop. It costs no more to grow good and pure varieties and have a good crop, than poor, inferior sorts and have a poor crop; there is but little difference in the expense at the start.

Now, you will ask, which are the best? Well, that is not so easy to answer as one would suppose. There are some seventy-five or one hundred different varieties of strawberries advertised, each claiming to be the best. Many of these are entirely worthless; others have some merits, and also demerits, and some are as good as represented; and there is no better way to determine what is good than through practical experience. I have tried many different varieties, and hold fast to the good, and discard the the worthless. After my experiments, I now cultivate for early varieties, Crystal City, Cinderella, Crescent Seedling, Captain Jack, Charles Downing, Sharpless, Green Prolific, Miner's Great Prolific, Mount Vernon, Triumph, Cumberland, and a few of Monarch of the West and Boyden's No. 30.

For raspberries of the black cap varieties I would recommend Mammoth Cluster, Gregg, and Seneca Black Cap. For red varieties, Queen of the Market, Turner, and Brandywine.

Blackberries—Snyder, and Missouri Mammoth.

Grapes—Concord, Champion, Worden's Seedling, Rogers Nos. 4 and 15; Martha is a good, hardy white grape.

Now all that is necessary to be successful in the cultivation of this kind of fruit is, to have your soil in good order, well manured, deeply plowed, well pulverized, plants well and thickly set in the row, rows three and one-half feet apart, plenty of pure and unmixed sorts; then keep the ground well stirred with cultivator and hoe, to keep down the weeds and keep the ground mellow; keep the runners off, and my word for it, you will be astonished at the quantity and quality of delicious fruit you will raise.

No family possessing an acre of land, or even one-half acre,sh ould be satisfied short of raising its own small fruits.

BEST VARIETIES OF APPLES.

BY E. D. PIERSON, HUDSON.

The subject committed to me is very easily treated in this way: When you are hungry for and crave a good apple above any other fruit, get a good, perfect, medium-sized apple, fully ripened, almost ready for the final change which awaits all fruit; wipe it clean; if your teeth are good, do not pare it; eat it without a knife; and I can assure you, you will find it to be one of the best varieties of the season, whether the time of trial be summer, fall or winter. Next, the way to preserve them for the longest possible time, is to keep them in a uniform temperature, as near to 30° of zero as you can, and not eat them, nor let any other person, and when you have done this to perfection, the apple will finally rot; but you certainly have kept them as long as you could, and you could not do better, if the sole object is to keep them.

The above is a short, definite and concise answer; but in sincerity I must say, that to give such an answer as your committee no doubt hope for, is far beyond my capacity.

My studies on the subject commenced more than fifty years ago; and twenty-five years ago I thought I knew the subject almost by heart. For about fifteen years I had studied it in New England, and fourteen years in Michigan, with the best text books I could procure. I thought myself competent to teach, and commenced by giving an order to Mr. Cooley, our Hudson nurseryman, to raise for me 1,500 apple trees to three years of age, of the kinds I would select, to be well cared for and well grown. These trees were designed wholly for raising marketable apples. The distinction between such apples and amateur dessert fruit is often marked and distinct.

I will give you a list of the fruit and number of each as I planted them in one orchard in the springs of 1861–2, premising that Mr. Cooley performed his contract in all respects to my satisfaction.

Here is the list I planted in that orchard after my twenty-five years' study of the subject:

144	Trees of	American Golden Russet.
77	"	Roxbury Russet.
33	"	Newtown Pippin.
60	"	Peck's Pleasant.
60	"	Fallowater.
55	"	Esopus Spitzenburgh.
55	"	Baldwin.
120	"	Westfield Seek-No-Further.
93	"	Bellflower.
44	"	Swaar.
22	"	Red Canada.
22	"	Rhode Island Greening.
33	"	New York Vandevere.
33	"	Tompkins Co. King.
27	"	Wagener.
27	"	Rambo.
60	"	Fall Pippin.
108	"	Red Astrachan.

I will now recapitulate these varieties, with my present view of them, only saying that judging from my past experience my choice twenty years hence would probably be different from to-day, although I cannot think the difference would be as much as in the past twenty years.

American Golden Russet.

One of the very best. I think the income from these trees the first fifteen years after setting was nearly as much as from all the rest of the orchard. This variety wants a pretty strong clay loam, to show their best. Let me say right here that all varieties want a thoroughly-drained deep soil, in good heart, and high rolling land. If possible secure a location near water, if it is only a running stream. One hundred feet above the water is better than fifty, and fifty feet is better than twenty-five.

Roxbury Russet.

The consumer would generally say that one bushel of these properly cared for to maturity was worth two bushels of preceding; but you can raise three bushels of Golden Russets to one of Roxbury here, judging from the thirty years' past.

Peck's Pleasant.

An excellent apple when well grown, and heretofore has been a good bearer, but for the last three or four years has not done as well as formerly.

Fallowater.

A large, coarse, green apple; very showy; bears pretty well; but, like the Pennock, buyers for their own use don't want it but once.

Esopus Spitzenburgh.

When well grown there is no better apple, but it is one of the shyest of bearers with us, and should never have space in a market orchard.

Baldwin.

Take it all in all, our very best market apple. The best way to raise the trees is to set Northern Spy or Bellflower trees, and after the trees are well started graft over to Baldwin. I have lost more of this variety by the bursting of the bark near the ground in severe winters than of all other varieties. I also think the tree will bear more if grafted in this way than by root grafts on seedling stocks.

Westfield Seek-No-Further.

Many years ago this apple was noted for its productiveness, the fairness of its fruit and its ready sale, as being adapted to almost all tastes. I considered this apple one of the very best when I set the orchard. Of late years it has not done well, and I should never set another tree of the variety.

Bellflower.

These trees were mostly set with a view of re-grafting to King and Baldwin. The present owner of the orchard has re-grafted the whole to Baldwin, and they are now the best-paying trees in the orchard.

Swaar.

A magnificent apple when well grown. To my taste I know of none superior; but I have never eaten such an one in Michigan. I would never set another tree.

Red Canada.

One of the best in the central portion of our peninsula, but I have never seen it pay here for a market apple. Raise a tree or two for home use.

Rhode Island Greening.

Does not do nearly as well as formerly. As a rule, very wormy; about the worst in this respect of any variety.

New York Vandevere.

Let this with us here be about the last variety to plant. Even the Pennock is better than this. It did well East as long as I knew it, and when I set the orchard I thought of setting twice the number I did.

Tompkins County King.

A very promising kind when it first commenced to bear with us. It quickly degenerated, and to-day I think it will not pay in the market orchard.

Wagener.

The very best early bearer I know. When young the fruit is fair and of excellent quality, but the tree is very short lived, and the fruit soon degenerates. This would have been the very apple for every pioneer hereabouts to have planted when he had cleared his first ten acres 35 to 50 years ago.

Rambo.

Not good for a market orchard.

Fall Pippin.

Never set another where you want apples. In Massachusetts it was our very best fall apple.

Red Astrachan.

This was the only early apple I set in that orchard. It is the best selling apple I know for very early fruit in all our large cities. But it wants picking before ripe. Is more of a cooking than an eating apple. So far as I am acquainted with the kind, it is a good average bearer with us. Had the person to whom I sold the orchard left the trees as he found them, I should now be prepared to give a decided judgment as to its merit. Immediately after purchasing he grafted all these trees to winter fruit. Did not take any precaution against borers. About as good as lost one-half the trees, making the only bad break in the orchard.

Northern Spy.

Of this variety I set none at first, on account of its tardiness in coming into bearing, generally taking about fifteen years; but I filled all vacancies the third year with this variety.

I have now gone through with my selection of twenty-five years ago for a market orchard.

As to the best mode of keeping apples, I gave it in brief at the commencement. On a large scale, I know of no way that I think more promising of success than that of the gentleman from Washtenaw county, who gave us so lucid an account of the construction of his apple house, at the meeting of the State Horticultural Society here. That building has been duplicated in Hudson the past summer, and is now on trial. I presume the proprietor will be pleased to show it to all wishing to examine it.

Were I to set an orchard of a thousand trees next spring I would plant one-half Baldwins, or Northern Spy or Bellflower, to re-graft with Baldwin. I would set one-fourth American Golden Russet. If I wanted any early fruit one-eighth Red Astrachan, half the balance Peck's Pleasant, and a few Northern

Spys, Winter Sweet Greenings, and, perhaps, two or three untested varieties with us.

As to varieties in our home orchards tastes differ, and all persons accustomed to the different kinds will make the selection that will best please their own palate, without very much regard to their productiveness. As for myself I know of no better kinds for very early than Early Yellow Harvest, Sour Bough, and Sweet Bough. For fall, I would select Early Joe, Twenty Ounce and Gravenstein. For winter, in addition to kinds I have named, I would have a tree or two of Melon, Ladies' Sweet, Tallman Sweet, etc.

In small amounts, as far as my experience goes, for long-keeping apples I would pack in good clean barrels—the nearer air-tight the better—head them up, and keep as near freezing point as possible until the season for use. Let the apples sweat under cover before you pack them. Earlier apples I would spread on shelves where I could have easy access to them at all times.

SAUGATUCK AND GANGES POMOLOGICAL SOCIETY.

There is no report from this society save some newspaper copies of addresses given before the society during the year, from which two are selected as especially worthy of a place in this volume. This society has done an excellent work for Western Allegan fruit-growers, and merits hearty support.

GREEN MANURING.

BY J. F. TAYLOR.

What I know about fertilization with green manure can be told in a few words. Green manures may be made from different products, such as clover, corn, peas, buckwheat, oats, and rye. Anything that will grow luxuriantly and quickly on a poor soil may be turned to a good account in fertilizing the same. At this time I shall only speak of one of these viz.: Rye, in its adaptation to the fertilization of orchards. Farm experiments in any and every line are attended with many difficulties. The same results do not always follow the same apparent causes. Fertilizers of the same grade and strength do not always produce the same results. The atmospheric changes and rainfall enter into the conditions of success with so many variations that no one can forecast the result with any degree of certainty. Experiments therefore must necessarily be repeated and carried on through a series of years with great care to secure results worthy of much confidence. There are, however, certain analogies between experimental cultivation of the soil and nature's methods of renewing her powers of production, so that we can not go far out of the way if we allow reason and common sense to do their part of the work.

Nature in her silent but mighty changes clothes herself in a drapery of green, for both utility and beauty. When the beauty has departed with the frosts of autumn then comes the utility. The vegetation which grew so luxuriantly during the past year becomes the natural fertilizer for the growths of the coming summer. The leaves that fall from their dizzy heights in autumn form the mould and mulch which moisten the root germs of the vegetable kingdom that are waiting for the signals of spring time to call them forth in glowing verdure. It must be evident to every observer of nature that decaying vegetation constitutes the large part of her recuperating power. Frost and snow and rain and heat are the chemicals thrown into her great laboratory to complete the work of enriching the otherwise barren soil. In fact without vegetable mould the earth is mostly debris of a very poor quality, entirely unfit for the production of vegetables and cereals. It is not until the outcropping of a scanty vegetation of the lowest order has produced an accumulation of alluvium that we find anything worthy to be called soil. It is also apparent to every one familiar with arable lands that when the vegetable properties are exhausted in any soil it becomes barren and unproductive.

The question has been asked if soil can be made to recuperate itself. Most certainly it can. All soils are formed by the natural growth and decay of vegetation. Mineral substances are the foundation upon which to build, but the building is constructed of herbage.

Now the true work of man, as an agriculturist, as a horticulturist, as a pomologist, is to take hold on nature's methods and improve them. A natural soil as it comes out of the forest is soon worn out by cultivation and cropping. Everything is taken off, nothing is put on; but let this process be reversed by a skillful hand and even nature's methods are outdone. If a luxuriant vegetation is plowed under it enriches the soil, if taken off its productiveness is impoverished. It will be admitted by all who are familiar with the growth of vegetation that it draws much nourishment from the atmosphere. Now by plowing under a large growth of foliage of any kind the producing qualities of the soil must be improved. It follows therefore from this discussion that the more abundant and luxuriant the growth of any cereal used as a fertilizer the greater will be the benefit derived therefrom and the more remunerative will be the effect on the orchard where the work is done.

In sowing rye for fertilization it becomes necessary to put it in the ground about the last days of August in order to secure an abundant foliage before winter. If this work is deferred until October the growth of straw is always slender and cannot produce very beneficial results. It must not be forgotten that a luxuriant foliage is the grand source of wealth to the land thus treated. Whatever interferes with this makes the process less remunerative. It follows also that when rye is plowed under for fertilization the work should be done as early in the season as heads begin to appear. Then the sap is in full flow and every day's delay diminishes the properties which enrich the soil. As the growing straw begins to harden it seems to lose those properties which make it valuable as a fertilizer and the result is a great disappointment to the cultivator. Another marked benefit to be derived from early sowing is that the growing rye in autumn forms a thick mat of green over the ground and keeps it warm during the cold blasts of winter,—a protection which growing trees always need to give the best results.

Nature covers her forest rootlets with an abundance of leaves every autumn, to keep them warm when they are asleep. Man will do well to imitate nature in this regard, for she is always true to her best interests.

Some may object to sowing rye in orchards in August, lest the cultivation produce a late growth of tree which cannot be well ripened for winter. We think this result is not to be feared where the land is so poor as to be in need of fertilization. Every orchard ought to be thoroughly cultivated during the dry part of the summer, even if the drought continues until September, so that the growth may not stop too early in the season; for as soon as the growth of wood is finished, the development of the fruit buds begins more rapidly, and may go on too far for the safety of these precious germs during the winter. Not a few pear, apple, and peach trees in some parts of this county put forth blossoms last autumn. This was evidently the result of continued dry weather by which the wood ceased to grow, and ripened for winter; but when the warm rains of September came, these trees put on a new growth as if it were spring time, and with all, blossoms and fruit. Now, if cultivation had been continued around these trees, so as to have kept them in a growing condition during all of the dry season, blossom buds would not have ripened so early as to be subject to a second growth. Then too, if rye is sown in August, it will for a time take that vitality from the soil which might otherwise go to the tree and prolong its growth when it ought to be preparing its wood for cold weather.

When spring has well opened, this same rye that has depleted the soil in autumn, to ripen the growing tree, is plowed under to stimulate it into a more vigorous life. If this course of cultivation is thoroughly followed for a few years, I think the most skeptical will admit that growing rye is a fertilizer of no insignificant qualities. In this way the fertility of our orchards will be constantly increasing, their vigor continually improving, and they will not fail to give us an abundance of that large, luscious, and highly-colored fruit, which always tempts the buyer and delights the producer by giving him an ample reward for his labor. I know that some respectable cultivators protest against the utility of rye as a fertilizer, but their failures may be attributed to some deviation from the most approved methods of doing this work. I remember reading an account of an experiment to fertilize with green rye, where the speaker said that "all the benefit he derived from it was by pasturing it during the autumn and early spring." Such experiments stultify common sense and ought never to be published except as an exhibition of folly, or as giving the reason why experiments in farming so frequently fail. They stultify themselves and bring disapointment to the experimenter. The end attained in such a course is equal to the means used, when you consider the real nature of the transaction. "Water will not run up hill." "Nothing will not produce something" in horticulture any more than in nature; but the larger the quantity of green vegetation that is plowed under in springtime, the more marked will be the effect on the orchard thus treated, "and don't you forget it." One year of this work is not enough. It must be followed up from year to year, as long as you wish your peach trees to come to the ingathering laden with brilliant fruit. They do not require high fertilization, but they must have some nourishment, in addition to constant cultivation or prove a failure.

VARIETIES OF PEACHES TO PLANT.

BY A. HAMILTON.

When peaches are scarce as they were this year almost any kind or quality will sell at remunerative prices, but when they are plentiful as they were last year only the very choicest will sell at really good figures. It may also be stated that in scarce as well as in plentiful years superior fruit will sell at a proportionately superior price, therefore, there can be no question about the desirability of growing fruit of extra size, quality and appearance. But what are these superior varieties, and how and where can they be procured is the question asked and the one I desire, as far as I can, to answer and hear discussed at this meeting.

In almost every large orchard there is a tree receiving the same cultivation and growing on the same soil, that produces better fruit than do the other trees of the same variety, and by using the best of these selected from the hundreds of thousands of trees growing in the great peach orchards by which we are surrounded to propagate from, trees could be obtained that would produce fruit very much superior to that produced by the ordinary trees of the same, or what appear to be the same, old varieties now in general cultivation, and that would be more profitable to cultivate and of course more desirable to set. The most remarkable of these remarkable trees to which my attention has been called and which have attracted general attention in the neighborhoods in which they are growing, are those owned by Mr. Reeks of Douglas, Mr. Ensfield of Ganges, Mr. N. W. Lewis of Ganges, Mr. Bandle of Saugatuck, and Mr. Purdy of Mack's Landing.

The Reeks peach ripens with the Amsden and Alexander, is about a third larger and quite as beautiful as these beautiful peaches and sells for double the price that can be obtained for these varieties grown on the same soil and sold at the same time in the same market. The Ensfield peach ripens a few days after the Hales, and is a Hales in every other respect, save that it does not rot as that variety usually does, and has been shipped sound without any special attention, year after year, when the ordinary Hales of the neighborhood rotted so badly that they could not be shipped.

The Lewis peach is a seeding of the Hill's Chili, and ripens between the Early Rivers and the Early Crawford. In size and general outside appearance it resembles the Hales, but the flesh is more solid, and of a creamy white and parts from the pit freely. It is valuable chiefly on account of its time of ripening, early bearing and hardihood. Mr. Walsh, one of Ganges' most successful growers, who has a few of these trees in bearing, has ordered 1,500 for next spring's setting.

The Bandle peach is a very large, high-colored, round, yellow peach, that ripens a few days before the Early Crawford, and sold last year for three dollars a crate, when other peaches of its season were scarcely paying expenses. The tree is an early and good bearer with him, and bore a crop this year when his other Crawfords (he calls it Crawford) are barren.

The Purdy peach is a marvel on account of its wonderful size, surpassing beauty and unequaled excellence and ripens a few days before the Late Crawford. It sold last year for three to five dollars per basket, when other good peaches were selling at fifty cents per basket. The tree is a thoroughly good, but not an early bearer. One tree yielded Mr. Purdy twenty-five baskets last year.

These, whatever they may be, are the kinds I would set, with the addition of Early Rivers, Mixon, Smock, and a few others wanted to fill up the parts of the peach season not occupied by those I have mentioned. The Briggs's Early, May and Waterloo are said to be a week earlier than any of the varieties I have mentioned, but whether they will prove to be so or not I am not prepared to say.

BENZIE COUNTY HORTICULTURAL SOCIETY.

PREPARED BY J. W. VAN DEMAN, SECRETARY.

At the annual meeting held in Benzonia, Benzie county, December 5, 1881, Hiram M. Spicer, of Frankfort, was elected President, J. W. VanDeman, of Benzonia, Secretary, and A. G. Butler, of Frankfort, Treasurer. In accordance with our amendment to the constitution we appointed for Benzonia township, J. J. Hubbell Vice President, Chas. F. Burroughs Township Secretary; for Blaine township (Gilmore P. O.) Wm. G. Voorheis Vice President, O. E. Putney Township Secretary; for Joyfield township, Chas. H. Parker Vice President, J. S. Perry Township Secretary; for Crystal Lake (Frankfort), James McKelvie Vice President, August Schmidt Township Secretary; for Pleasanton, township, D. R. Van Amburg Vice President, A. M. Warren Township Secretary. The regular meetings for the year 1882 were appointed for every fourth Wednesday evening, and the calendar was printed on postal cards and sent to each member.

The first monthly meeting was held at Pleasanton (Van Amburg school house), Manistee county, January 4, 1882; Vice President Van Amburg conducted the meeting. The secretary explained the object of the society and the advantages of our amendment to the constitution, by which whenever a township in our county or vicinity has a membership of five we appoint for them a local vice president and secretary, who can conduct regular monthly meetings in their communities in the absence of the president and secretary who cannot always attend every meeting. In this way by holding meetings in different parts of the county, we give opprotunity to many persons interested in fruit growing, but who cannot go very far from their farms to attend such meetings, to reap many advantages from the knowledge of others and to impart to their visitors some items from their store house of experience. We think this a valuable feature of our work.

Vice-President C. H. Parker of Joyfield, followed with remarks in the same strain, encouraging fruit men to instruct and help each other and unite in horticultural work.

The first topic for discussion was "What is the best for us to raise in this region, grain or fruit?" Remarks were favorable to fruit growing as much more profitable acre for acre.

Second topic discussed: "What is the proper distance to set fruit trees from each other?" Apples two rods, peaches, pears, and plums one rod.

Third topic: "What is the proper height to head fruit trees?" Low heads, three to four feet, were favored by most of those present.

There was a good show of specimens of Golden Russet, Roxbury Russet, Greening, Rawle's Janet, and Ben Davis apples. Excellent grapes were shown by C. H. Parker, well preserved and good for eating; varieties, Salem, Ionia, Agawam, Perkins, and Isabella. The meeting was a success.

The next regular meeting was to be held in Blaine township, February 1, but the secretary being absent from the county and members not knowing the certainty of a meeting, none was held.

March 1, society met in Frankfort, in the business house of August Schmidt. It was resolved "to urge the planting of forest trees along the public highways; to urge the fruit growers of this county to use every possible effort to destroy the codling moth; to secure prices and samples of fruit baskets and packages for use of the members of this society; to recommend planting corn in young orchards.

March 29, society met in Joyfield, but no minutes were sent to the secretary for record. They had a good meeting and grapes to eat from C. H. Parker's cellar.

The fourth meeting was held in the college hall in Benzonia, President Spicer in the chair. Secretary Schmidt reported correspondence about fruit packages and showed samples. Wm. A. Betts and Wm. G. Voorheis remarked that they had seen in the New York Witness and other papers inquiries whether there were any fruit lands in Michigan still open to settlement. We as a society wish to say to the world that there are as good fruit lands in our county and vicinity as anywhere for apples, pears, plums, peaches, and small fruits, and good markets within reach by boats. The secretary made remarks about setting out trees and illustrated the hexagonal plan.

A special meeting was held in Frankfort May 17. August Schmidt was authorized to buy as many fruit packages as he deemed necessary for the season's trade, and to sell to the members at lower rates than to others.

May 24, society met in Pleasanton, President Van Amburg conducting. First topic: Is mulching better than cultivation for young orchards? No; plowing deep and close to trees while young will keep roots down in bottom of furrow. If seeded down and mulched the roots will come nearer the surface to get moisture. Pruning: Don't let cross limbs get large enough to need sawing off. Prune mostly by rubbing off buds or shoots when they come where not wanted.

June 21, society met in Putney school-house, in Blaine township, at 8 P. M. Discussions were varied and interesting and fruit growers much encouraged by the meeting. Winter apples regarded as best for profit. Cities will always want the products of our cellars in the spring. We can keep apples all the year round in our sandy soil.

July 19, society met in Frankfort, President Spicer conducting. Henry Woodward was elected vice-president in place of James McKelvie, lately deceased. A committee of ladies was appointed to arrange a floral display at the next meeting, and prizes were offered. Mr. J. J. Hubbell, of Benzonia, gave an interesting report of the State horticultural meeting in Pentwater last month. Fruit packages are for sale at Aug. Schmidt's fruit emporium.

August 16, a meeting was held in Joyfield but the secretary was not there and no minutes were forwarded.

September 13, society met in school-house in Benzonia, at close of evening session of teachers' institute, President Spicer conducting. Remarks were made by Prof. Latta of Allegan and others. A fine display of summer fruits was shown. Prof. Latta and Mr. and Mrs. Amasa Waters were appointed judges and awarded premiums for best Duchess of Oldenburg to H. M. Spicer; best Red Astrachan, H. M. Spicer; best plate plums, J. J. Hubbell, for Coe's Golden Drop; best plate peaches, J. W. VanDeman, New York Rareripe.

Several members took part in discussions about peaches. Snow's Orange, Hale's Early, Bower's Early were recommended. Crawford's are best for family use. "What has caused our trees to lose their foliage?" Cold weather in June, the same freeze that caused the apples to drop off.

October 11, society met in the grange hall in Pleasanton, Manistee county, President Van Amburg chairman. Discussions varied and interesting. Premiums paid in cash for best plate of Chenango strawberry, best plate Lowell, Maiden's Blush, and Haas, best peaches, pears, and grapes. Six new members were received at this meeting and the efforts of our horticultural society seemed to be fully appreciated.

Premiums were offered for display of fruits at the next meeting in Blaine township, which was held November 8, 1882, Vice-President Wm. G. Voorheis in the chair. The secretary read minutes of last meeting. First topic, "What is the most profitable variety of apple to raise for market?" For summer, Red Astrachan, Duchess of Oldenburg; for fall, Maiden Blush, Chenango Strawberry; for winter, Baldwin, Greening, and Talman Sweet. Question: Will Baldwin and Greening keep until we can market them in the spring: Yes, if buried in pits. Rufus Putney has kept in pits with elm bark for a roof to keep out deep snow. Mr. Van Amburg had seen splendid Russets kept till spring buried in tight barrels in the ground on a sandy knoll. Secretary knew of Greenings having been kept in Benzonia in cellars until the second year. Peaches and grapes were discussed and best varieties recommended. Premiums were paid for best winter apples.

Society adjourned until annual meeting in Frankfort December 13, 1882. The membership of this society for 1882 is 39.

INGHAM COUNTY HORTICULTURAL SOCIETY.

The meetings of this society are reported monthly for the Lansing Republican and the following abstract is made by the compiler of this volume.

At the January meeting Wm. Appleton read a good paper on

DESIGN, MANAGEMENT, AND KEEPING OF CEMETERIES.

We quote somewhat largely from it as follows:

The ground plan of a cemetery differs but little from the plan of any other landscape; one thing, however, may differ a little. The drives or roads of a cemetery are also its surface drains, hence the parts used for interment purposes should be made by grading (if they are not so already) more or less descending to the drives, with this difference; any plan that would be good in any other grounds is equally good for a cemetery. A well planned cemetery must also have a much greater amount of road than ordinary grounds, because access must be provided to all its parts for heavy laden teams. There being no part of a cemetery which is not liable to have a monument erected thereon, the hauling of which and the necessary foundation, would of necescessity trespass upon, deface, and injure adjacent burial lots, to the damage and annoyance of their owners, unless the designer had provided, either by the regular drives or suitable alleys, a wagon way to each lot. The roads of a place of this character should always be of a width proportioned ro their length. I mean by this, if the grounds are of small extent, the drives should not be too broad, a wide roadway having a tendency to shorten curves and make them appear too sharp, and thus destroy the beauty of what was intended to be a flowing outline. Drives that are too wide also give the appearance of too much road. To avoid this as much as possible, it is well to plant heavily of shrubs in the angles formed by the junction of two or more roads. Attention to every detail is necessary to obtain the best results. The beauties of a cemetery are mainly, pleasing slopes, graceful curves, green grass, well-formed growing trees, to contrast with its gravel roads, the whole relieved by its wealth of sculptured stone. In planting trees for ornament in a cemetery, perhaps a greater proportion of evergreens is allowable than in other grounds. First, they are symbols of eternity, and second, they enliven a winter scene by their beautiful form and color,—for alas! our visits to a necropolis are not confined to balmy summer, but also in dreary winter do we have to deposit our precious jewels in their last resting place; and in whatever season we may be called upon to perform the last sad rites over mortality, it is our endeavor to lighten the burden of woe. The feeling of awe which must possess every right-minded person when brought into the presence of the grim monster, death, should be tempered with a feeling of grateful dependence on our Creator, and of resignation to his divine will and wisdom; and to be in sympathy with this feeling by an appeal to the outward senses is the artist's desire in planning cemetery grounds. To do this most effecting is the masterpiece of the art.

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In building a cemetery we are not only honoring the dead, and thereby exercising a very natural attribute, but we are also teaching the living. How many persons there are, fellow citizens with us, in this great republic, who by the very nature of their vocation have not the opportunity of gazing at a beautiful view in a landscape, where the art of man has joined with nature in producing the most pleasing of all sights to the eye, only as they see it in one of our cemeteries; for however gloomy the thoughts may be, when musing on the purposes of a cemetery, that does not change the fact that the view itself is beautiful. Now if this be true in respect to so large and important a class of our neighbors, how necessary it is that we bear this matter of education for the living in our minds, and that in our efforts to make a public cemetery we permit nothing but the most correct taste, combined with adaptation to the purposes for which it is to be used.

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So important is the care and keeping of the grounds that, if this is neglected, no matter how well it is planned, all the beauty will have departed and all previous labor be lost, if slovenly or unskillful persons are permitted to have charge. In view of the interest the public has in this matter, it seems almost akin to sacrilege to put a boor in charge of a modern cemetery. The clown in Hamlet served the purpose of a grave-digger, but he is not the man to keep a cemetery in good order. The constant disturbance of the surface by burials, erecting monuments, grading lots, etc., all make a continuous appearance of disorder, unless watchful care is exercised to prevent it. Not a weed should be seen in the drives; their outlines should be well defined; the grass should be closely mown; surface disturbances attended to; unsightly objects removed; trees and shrubs kept in symmetrical and proper shape; in fact, everything possible should be done to give a neat and tasteful appearance to the whole place. The people have a right to demand this of the management, and if the management itself has in it an element of ignorance, lack of taste, or any improper motive, it should be called to a strict account.

The February meeting was given up to vegetables and the following paper was read by Secretary Parks.

RAISING ONIONS AND ROOTS.

The most desirable soil for raising onions is black sandy loam with a mixture of clay. Any land that is well drained and that will raise good potatoes, will raise onions, if properly prepared. To prepare land for onions a piece should be selected, to begin with, that has been worked two years in hoed crops and heavily manured, and kept free from weeds during that time. In October apply about 50 loads to the acre of well rotted manure. Spread the manure evenly over the land and plow it under, taking a narrow and shallow furrow and cutting the land fine, leaving the manure near the surface, well mixed with the soil. Several crops may be raised on the same ground in succession by giving it a top dressing with well-composted manure. A wheel cultivator or spring-tooth drag may be used to stir up and mix the soil, instead of plowing, after the first crop is taken off. Great care should be observed to get good seed, as it is one of the several requisites to success.

We know of several pieces of swamp or marsh land in this section that have been thoroughly drained and cultivated in other crops until the soil has become composted and contains all the qualities requisite to raising onions without the aid of manures, where good crops have been raised several seasons in succession; but all marsh or swamp lands do not contain those elements. We believe, however, that the best of them will have to draw on the gardener's bank—the compost heap—for resources to continue business for a term of years.

The onion must have a clean and a very rich, fine soil. Use well-rotted manure freely, and be sure to get the seed in as early as possible in the spring. Thin out early, and keep the soil mellow and clear of weeds. Sow in shallow drills not less than a foot apart (using a seed drill if at hand), and thin out when the onions are about the size of quills. In doing this disturb those that remain as little as possible. As onions grow on top of the ground they may be allowed to grow pretty thick, no matter if they crowd each other. In hoeing to destroy weeds and keep the ground mellow, do not cover the young bulbs with earth. Four pounds of seed are usually required for an acre. Most of the seed drills have a place in the bottom of the feed box, No. 4 usually sowing four pounds of seed to the acre, No. 5 five pounds, etc. When large onions are wanted they should be thinned to six inches apart in the rows. Cover seed one-half inch deep. As soon as the onions are up so the rows may be followed, give them the first hoeing by a slight skimming of the surface between the rows. In a few days the second hoeing must be done, followed by weeding. This operation must be thoroughly done; the earth should be loosened around each plant, in order to kill small weeds that are too small to be seen. This operation should be repeated once in ten days or two weeks during May, June, and July. If well kept there will be but few weeds to be seen in August, but stirring the earth between rows while growing will be beneficial and will increase growth. When the tops die and fall the crop should be pulled and spread evenly on the ground to dry. When thoroughly dry cut off tops one-half inch from bulb and spread in a dry place protected from the sun, where they can remain until marketed or placed in their winter quarters.

How to keep onions through the winter is a subject open for discussion. There are many known methods. It seems to be conceded by all that there are several conditions that must be complied with if we would look for success. Freezing and thawing during the winter will surely entail loss. When kept in warm cellars in houses they have failed to keep well. The most successful way of keeping them is to spread on shelves or shallow bins in cool cellars, where a continuous temperature can be maintained of 50° to 40° F. The essentials for the preservation of onions are dryness, thorough ventilation, and freedom from frosts.

A good way to keep other roots through winter is to bury them in pits; cover with straw and dirt with two alternate layers, each four inches thick. If wanted during the winter they may be placed in a cellar bottom; cover them over with moist sand, sawdust, or dirt. They can be taken out at any time in a fresh condition. To keep cabbage through the winter, select a side hill, dig a trench 18 inches wide and 12 inches deep down hill. If the sides incline to cave, lay in boards to maintain trench. Lay straw in bottom of trench. Take off the rough outside leaves. Set the cabbages in trench roots up, crowd them in closely, with straw around them as high as roots; lay poles or rails along each side to raise up above roots, if necessary. Lay stringers crosswise to receive a board covering. The covering may be removed during winter if needed for use.

Soil for vegetable gardening should be composed of a variety of soils. While nature with all her generosity has given us the varieties we need for all purposes. yet we don't find it laid down where we want it under all circumstances We often find our lot cast on soil that is not suitable for gardening purposes. When we find ourselves thus located on a cold clay soil that is too level to under.

drain, the next best thing will be to make surface ditches to let off surface water, then haul on sand, swamp muck, and well-composted manures to the depth of four inches. Repeat the process the second year; plow eight inches deep. The land will be ready the second year for business. When we find too much sand we should haul on other soils to make it of the proper consistency; but the products of the compost heap take very kindly to all the varieties of soils we have to contend with, and a successful gardener will see that he is well supplied with that indispensable article. There are many thousands of dollars wasted every year by planting vegetable and flower seeds on soils that are unfitted for the tiny little seeds, but there are many other causes of failure. The soil may be good and all other requisites may have been carefully complied with until the weeding and thinning comes in hot days in June and July (many a boy has said he was sorry he had ever learned the trade), when if neglected at this time the weeds are allowed to grow with the plants, you soon have an unsightly plat of ground that is usually subdued with a scythe instead of a hoe. In giving the method of raising onions the same method will prove successful in raising roots of all kinds, although the time of planting may differ. The system of raising vegetables on beds raised up from four to six inches high seems to be found among the lost arts. Nearly all successful gardeners are planting the ground in a flat condition, making the rows long, and when it is practicable the rows are far enough apart to work a horse between them. If too close for horse work the hand cultivator can be more successfully used. The importance of firming down the soil after planting fine seeds is too little thought of by the average gardener. There is an old rule that seeds should be covered with fine earth two and one-half times its breadth, which is a rule safe to follow. The firming down the ground so that it comes in contact with the seed does very much to aid germination. A hand roller is an indispensible article in a garden. I will here name other tools that can be made by any person with ordinary ingenuity. A hand marker with four or five teeth 12 inches long and 16 inches apart, with a tongue to draw it by. An onion weeder can be made by taking a piece of hoop iron 16 inches long, grind one edge six inches in center, bend it up, fit it on hard wood block and nail fast, adjust it to suit the operator, and bore hole in center for handle. This can be used among small plants and weeds. It cuts off small weeds; they pass over the knife leaving ground level. A sieve for sifting dirt on seed bed may be made by taking a fanning-mill screen and nail on sides three inches high of one-half inch stuff. It is an indispensable article in a garden.

The March meeting was occupied in discussing

HOT-BEDS.

F. B. Johnson's hot-bed was made as follows: He used sash 3x6 feet and made cribs of 1½ inch boards without bottom, 16 inches high at front and 22 inches on back side—champering ends to fit sash, and long enough to receive three sash filled with glass. He commenced to get the manure ready about mid-winter to admit of its being forked over twice to promote fermentation. It should be well mixed, and when ready for the crib, laid down two feet thick and about one foot larger each way than the size of crib which rested on the manure bed. He used a covering three inches thick of rich soil and clay and also leaf mold and decomposed sod, making five inches in all. This should be made fine. He sows seeds in drills four inches apart on the 20th of March, giving the bed full strength of glass heat until April 1, at which time a partial screen may be needed, for which a coat of whitewash is desirable. He would give cabbage a lower temperature than he would tomatoes or peppers—the former 85° and the latter 90°.

Geo. W. Parks gave his plan as follows: He dug out a trench eighteen inches deep and six feet wide on a side hill where he could get a rise from the arch to the chimney about one foot in twenty. He used a stove for an arch, setting it on the ground and running a brick flue, 6x10 inches on inside, in center of trench fifty feet to chimney. The chimney may be made of boards, 6x10 inches on inside and twelve feet high. Now the bed must be made by taking 2x4 lumber and posts thirty-six inches long for back side, and thirty inches for front side. The cross stringers should be oak plank six feet long and 1½x5 inches. Nail the stringers to posts, raising them one inch above flue. The brackets thus made should be six feet apart after they are placed in position. The floor should be laid of coarse lumber to receive the dirt, which should be six inches deep, of rich soil, composed of decomposed sods, leaves, etc. Before putting in dirt the sides should be boarded up from the cross strings on the inside and from the ground on outside to the top of posts. The space between posts should be filled with leaves or fine straw, using dirt from trench to bank up with on outside. It is now ready for the sash. He said he used the end nearest the arch for tomatoes, putting cabbage and other plants requiring a lower temperature nearer the chimney. A portion of the bed should be kept for boxes or flats to transplant into, so they can be taken out and moved without disturbing plants. It will be necessary to build a furnace house for furnace, which should be made tight, and can be made of coarse lumber, and if well lighted and large enough it could be utilized as a tool-house.

School ground embellishment was discussed somewhat, and on motion of Mr. Johnson, the following resolution was adopted by a unanimous vote:

Resolved, That we, the members of the horticultural society, are in sympathy with the efforts of the State Horticultural Society in encouraging the embellishment of school grounds throughout the State, and we and each of us agree to do all we can to encourage the embellishment of school grounds in our respective school districts to which we belong by properly fencing and a judicious planting of trees, shrubbery, and flowers.

The April meeting was occupied with a discussion on

KITCHEN GARDENING.

Mr. Robert Mann read a very excellent paper upon the topic. Among other things he said:

The most common error people make is planting too much land, and the second mistake is planting too many kinds. Much better satisfaction will be given at the end of the season if a few varieties are planted and well cultivated. One of the most necessary things is to have good plants and have them early, therefore a hot-bed is very convenient to start seeds in. If that takes too much attention, make a cold-frame, which is nearly as good, but not quite as early; in fact, I think a person not familiar with a hot-bed will have better success with a cold-frame, as he will probably get better plants if not quite so early. If the garden is small a person can get along without either, as the seeds can be planted in boxes of earth and kept in the house and set out in the sun on warm days. Be careful and not let them suffer for want of water, as they will dry out very quickly if only a slight wind is blowing. We water at any time of the day if dry, but prefer evening if the weather is mild. If cold we water in the morning. Use shallow boxes to plant in,—two and one-half inches is deep enough and will be much easier to handle than deeper ones.

When sowing seed be sure and put in plenty and press the soil firmly with the back of the spade. When the seeds break the ground it is a good plan to rake over the whole bed with a sharp steel rake, going lengthwise of the rows, which will break the crust and allow the plants to come up. Good parsnip and other fine seed will sometimes fail unless the crust be broken, as the young plants are very weak and unable to push through, particularly if sown thin. Use plenty of old manure, keep the ground clean and as level as may be, not digging out deep paths and making high beds, but plant in rows the whole length of the plot, and the labor to keep clean will be much less.

The June meeting was given up to

PLUMS AND BERRIES,

Dr. Marshall speaking of plum growing, and Ezra Jones, Messrs. Johnson, Beal, Van Auken, Stebbins, Gardener, and others discussing strawberry growing.

Mrs. D. L. Case said, concerning canning, the fruit should be rare, ripe, and fresh. Fruit from the market or brought from a distance will not keep as well as when taken fresh from the garden. She steams her fruit instead of boiling. She likes to put sugar on her strawberries and let them stand over night before canning. This hardens the berries. She does not heat the jar but stands a knife in it, and the hot fruit will not break it. She believes drying fruit by improved processes will yet supersede canning.

Mrs Emery said a glass jar will not be broken by the hot fruit if stood on a wet cloth.

Mr. Mann said sour fruit well sweetened will keep better than sweet fruit.

The July meeting continued the discussion of small fruits begun in June.

I. W. Van Auken exhibited eleven kinds of strawberries that were named as follows: Sharpless, Captain Jack, Green Prolific, Marvin, Cumberland Triumph, Kentucky, Crescent Seedling, Col. Cheeney, Endicott, Windsor Chief, Triumph of America. On being asked to make a choice of the best three varieties, he named the Crescent Seedling for earliness, productiveness, hardiness, and good quality; Triumph of America as largest and among the first, and Marvin last but not least, as it has all the good qualities desirable for a first-class shipping berry, and good enough to please the most fastidious epicure. F. B. Johnson was asked to name the best three varieties on his grounds. He named the Crescent Seedling for early, Sharpless Medium, Cumberland Triumph, and Windsor Chief for late.

LAWTON POMOLOGICAL SOCIETY.

REPORTED BY C. D. LAWTON, SECRETARY.

OFFICERS.

President—N. H. Bitely.

Secretary—Charles D. Lawton.

We had at Lawton a profitable fruit year. Peaches were a light crop, but they sold at unprecedented prices, so that nearly as much money was received as if we had a full crop. The main portion of my crop sold at 60 cents, 75 cents, $1.00, $1.25 per basket. There were so few peaches on the trees that they grew very large and thus sold at fancy prices. Some varieties gave a full yield and some orchards yielded a very full crop compared to others that bore lightly. Location seemed to have had a good deal of influence as well as variety. The kinds that yielded best were the Beatrice, Alexander, Early Rivers, Hales, Snow's Orange, Barnard and Hill's Chili. Crawfords, Old Mixon and Stumps generally bore lightly, though what there were of them were unusually fine. Mountain Rose and Ward's Late did fairly. The early kinds rotted badly and much loss was experienced on that account. The Hill's Chili trees were loaded, but they are a poor peach and ordinarily of not much account; this year, however, they sold very well. They are a valuable peach for drying, as they generally bear well and the flesh cleaves readily from the pit. We never had our trees go through the winter in better condition and so great a promise of an abundant harvest as we had up to the time of blossoming, when the severe spring frost occurred, killing the greater portion of the fruit buds. The high lands seemed to have suffered quite as badly as did the lower elevations. Some orchards that were favored by the protection of a belt of timber on the west and southwest, or which were situated on an eastern slope, or had some high lands to the west, bore finely; while others that are upon high ground, open in all directions, bore very lightly. Trees situated in slight ravines or hollows in our orchard are the ones that yielded the most bountifully. I have three ravines in my orchard, places where sometimes the trees have killed out in severe winters; but this year it was from the trees in these situations that I got the most of my fruit, and the same was true in other orchards.

Our people have been especially vigilant the past season in exterminating trees affected with the "yellows." I think that, in the vicinity of Lawton, diseased trees were all taken out. The proportion destroyed was somewhat greater than in former seasons, but the excess may be due to the previous year's negligence. Our most careful and observing fruit growers still have faith that they can continue to raise peaches successfully by promptly eradicating the diseased trees. Of grapes we had an enormous crop, especially of Concords. Probably we shipped from our station two thousand tons. They were unprecedentedly late in ripening, and so had to be rushed off at a time when the markets were crowded, consequently low prices were generally realized. Those who shipped early were the most fortunate. Mr. L. L. Halstead was among these lucky few. He sent to Chicago, mainly before the market was glutted, thirteen and a half tons of Concords, picked from 1,800 four years' old vines, from the sales of which he realized upwards $1,000. Those who held their fruit until later in the season were also fortunate, realizing from six to ten cents per pound gross sales. The Delawares and other similar varieties were a failure. The vines were loaded with fruit—as fine, promising bunches as ever were seen—which remained all right up to the usual time of ripening, when the foliage suddenly succumbed to the combined destructive influences of the thrips and leaf blight, and withered and fell to the ground, leaving an enormous load of green fruit, which ripened (?) so imperfectly as to be of little value. In fact, the only grape produced in our vicinity in quantity sufficient to be thoroughly tested, "that stood the racket" completely, was the Concord. The Brighton, of which a few are raised, did well; and afford every indication that it could be successfully and profitably raised on an extended scale. The same is true of the Worden; in fact, while similar to the Concord, I think the advantage is in favor of the Worden. It is a better grape, rather larger berry and bunch. A number of us have a moderate quantity of the Pocklington, Prentiss, Virgennes Dutchess, and a few small vineyards of the much lauded and monopolized Niagara growing, which, so far as I have observed, have made excellent growth. The past summer was an exceedingly favorable one for fungus development, and, as is generally known, mildew was unusually prevalent. All grape vines that I have seen showed more or less of mildew, and to this the Niagara is not an exception. Much to my surprise the Dutchess showed the least mildew, or rather held out the longest, and showed it later than the other varieties. I saw Dutchess, Prentiss, Virgennes, Niagara, etc., growing in the same plat of ground, and when all the others were showing mildew the Dutchess was exempt from it. A few years of trial will tell the story, and there is no other test.

Pear trees bore well, and those who had trees had a good crop of fruit. There was also but little blight. No varieties do better than the Bartlett and the Flemish Beauty. Apples were a failure. I have never known so poor a crop and so poor fruit in our vicinity as we had the past season; of course, what few there were to sell brought a good price. At the time of blossoming we had ample promise of a most abundant harvest; but the continued and severe frosts destroyed the fruit. This was the bearing year; it remains to be seen if the next season, "the off year," gives us a full harvest of apples, which will tend to settle the mooted question that the bearing year may be changed by early denuding a tree of its fruit in a full year.

GREENVILLE HORTICULTURAL SOCIETY.

OFFICERS FOR 1883.

President—J. C. Stoughton.
Vice-President—B. S. Bigley.
Secretary—John E. Taylor.
Treasurer—Mrs. Jas. W. Belknap.

Secretary Taylor in sending in the list of officers makes the following personal observations which are certainly worth considering by orchardists, and his request for assistance in observing is a very reasonable one.

In the spring of 1880 my father's orchard bloomed very abundantly and the honey bees stored large quantities of honey from the blossoms. There was an unusually large crop of apples. In 1881 the orchard blossomed as full as usual. The bumble bees were seen in large numbers working upon the blossoms, but there were no honey bees to be found about them. There was but a poor yield of fruit in the fall. In the spring of 1882, excepting upon four trees, few bees of any variety were seen about the abundant blossoms. The four trees excepted stood near a spring and the honey bees made loud music about them for several days. The four trees, two of an unknown sweet variety, and two of the Snow apple, yielded an abundance of fine fruit. The balance of the orchard yielded a very few apples of very inferior quality. Now will some one else join me in observing this class of phenomena and note minute details that may reach some system of predicting in the spring what will be the fall yield of fruit. Some of my neighbors do not laugh at me as much as they did for saying that there will be a poor crop of apples when the honey bee fails to do its duty in fertilizing the flowers.

BAY COUNTY HORTICULTURAL SOCIETY.

OFFICERS FOR 1883.

President—B. F. Partridge.
Secretary—A. Corbin.
Treasurer—N. Knight.
Directors—Wm. Maxon, Wm. Gafney.

Mr. A. R. Wedthoff, the Secretary of the society during 1882, died about the time of the annual fairs, and the following report has been kindly furnished by Mr. A. Corbin, the present Secretary:

SECRETARY GARFIELD: *Dear Sir,*—From the records that I have at hand, it seems there were but three meetings during the year 1882, and from the records of our late Secretary I find them as follows:

The first meeting was March 25th, with but few members in attendance. There were some very interesting discussions on different subjects. Society adjourned to June 17.

The June meeting was called to order by the President, B. F. Partridge, who stated that this meeting was called for the purpose of exhibiting strawberries and flowers. This was the first meeting of our society worth calling a horticultural meeting.

The exhibition of strawberries and flowers was grand. The table arranged by Mrs. Freeman was a beautiful sight. The following varieties of strawberries were exhibited by J. R. Hall: Seedling, Sharpless, Jucunda, Monarch of the West; by A. Corbin: Bidwell, Boyden, Glossey Cone, Tripple Crown, Jucunda, Monarch, Captain Jack; by T. Rundell: Mammoth Wild and Longfellow; by J. F. Romer: Monarch of the West, Boyden No. 30, Chas. Downing, Bidwell, and Early Scarlet; by John Jones: Wilson; by A. Birch: Wilson, Downing, President Wilder, Michigan; by H. Meisel: Wilson.

There was a very interesting discussion on the merits and demerits and cultivation of fruits exhibited. The meeting adjourned to August 18th, for the purpose of exhibiting fruit, flowers, and vegetables, and to make arrangements for the State and county fairs.

There is no complete record of the August meeting in the books or papers that I have belonging to the society. There was a good display of fruits and flowers, also an increasing interest manifested at that meeting.

By the death of Mr. Wedthoff, our late secretary, we have lost one of our most interested workers. He was always on hand and also made individual efforts to secure the presence of others. He contributed largely to the interest of the meetings by his own exhibits which were especially choice. The meeting of August 18 was the last he attended, his sickness and death occurring soon after. At the exhibition at that time the display of early fall fruits and autumn flowers was exceedingly fine. Mrs. Freeman exhibited some canned fruits which attracted a great deal of attention. Her method of preparing and canning is a superior one. Mr. Albert Birch exhibited Red Astrachan, Early Harvest, and Russian apples. Mr. Chas. Bradford exhibited Red Astrachan, Sour Bough, Sweet Bough, Lowell, Early Strawberry, Craig's August, Golden Sweet, Williams' Favorite apples, also a plate of Transcendent crab-apples. C. F. Corbin exhibited Lawton blackberries, Early Harvest and Red Astrachan apples, also a beautiful display of flowers. Flowers were also exhibited by Mrs. Freeman and Mrs. John Russell.

Mr. Wedthoff presided at the meeting, the president, Mr. Partridge, being absent, and made some excellent suggestions in regard to the local benefit to be derived from a general attendance at these exhibitions and urged those present to persist in their efforts.

Bay county has every natural facility for becoming one of the leading counties in horticultural work. The display we made at the Northeastern fair was astonishing, and for fine fruits and choice vegetables we are yet to be beaten. The quantity produced of course is less than some others, but the quality is fully equal to any.

ALLEGAN COUNTY POMOLOGICAL SOCIETY.

PREPARED BY EDWY C. REID.

OFFICERS FOR 1883.

President—John B. Dumont.
Vice President—M. T. Smith.
Secretary—Andrew J. Bracelin.
Treasurer—Allen Wood.

May Meeting.

M. T. Smith of Hopkins spoke of grape culture, which he deems the pleasantest branch of horticulture. In planting a vineyard the ground should be prepared as for corn, and any ground which will produce a good corn crop is fit for grapes. His vines are eight feet apart each way, but he thinks it would be better to set vines ten feet apart one way by at least eight the other. They should be planted—not merely stuck into the ground—with roots placed in their natural position as nearly as possible, after trimming off all the bruised roots. A stake should be driven for each vine before it is set, and the earth should be packed around the vine when set. All buds but one should be rubbed off and the laterals pinched off as they appear, so as to grow the first year only a single cane. Cultivate thoroughly, as corn, and nearly any crop but potatoes may be raised the first year between the rows. At any time between the fall ripening and spring starting, cut back to one foot in height. He would not use trellises because vines can be better cared for and produce better fruit on stakes. Grow two canes the second year, winding them about the stake and nailing them there. Last year he cut out one-half of each vine, leaving only a single cane, and got the largest and best crop he ever had. He has now but one vine to each stake, and the trunks have become so strong as to stand alone and nearly bear the whole weight of the fruit. In subsequent prunings he leaves but two buds of the last year's growth, and the laterals from these should be pinched off to within one leaf of the last bunch of fruit. There should be no cultivation or pruning after August until the harvest. The fifth year he would cut away until within two buds of the parent stem. Accessory buds may be used to reshape the vines or get new canes. The only fertilizer he has used is barnyard manure; bone-dust may be good. He would cultivate continually the original cane rather than renew by sprouts from the roots. He would cultivate no crop among vines after the third year. His vines had not failed of a crop for ten years. He markets in Grand Rapids in baskets holding from sixteen to eighteen pounds, covered with tarletan. He considers the Concord the best for market of any grape yet grown here. The Delaware commands the highest price, but will yield six times as much fruit and sell for only two or three cents per pound. The Hartford is good, productive, and hardy, but ripens at about the same time as the Concord and does not sell as readily.

Mr. Buck thought Mr. Smith's plan superior to the "renewal process" of starting new canes from near the root.

Mr. Smith said his vineyard was surrounded by grass and the vines nearest the sod bore least; so he would never think of seeding down a vineyard. A system of pruning cannot be followed with exactness, but variations within the bounds of good judgment must be used. Delawares can be raised best by cutting back severely.

Mr. Buck once had 300 vines of fourteen varieties, but the rose bugs did so much damage that he quit raising grapes.

Mrs. Holton said a solution of chloride of lime would kill rose bugs and many other insects, including the cabbage worm.

Mr. Buck said it might do so, but it or any other such remedy could only be applied with great difficulty. These bugs appear from the 8th to the 13th of June. They do not stay long, but come in swarms, eating besides the grapes, the best peaches, certain sorts of apples, and even clover. They work chiefly on sandy soils.

Mr. Latta called attention to the fact that the best fruit grown here is seldom obtainable in the village market. Several members said it was the fault of the dealers, who would not pay a proper price for it. Some of them do not know what really good fruit is. The grape market is ruined each year by the offering by certain growers of fruit somewhat colored but not ripe. The dealers take it at the first of the season, and, being unable to sell it, refrain afterward from buying that which is ripe and good. Thus the poor, unripe stuff fixes the price or prevents the sale of the best fruit. One member, after being offered but two cents per pound for his grapes by the grocers, sold them from his wagon for seven. Another said the best fruit was produced by the commercial growers, who, not being able to sell all their product in the home market, shipped the whole away, leaving only the imperfect fruit of the small growers to supply the home market. Others had been able to sell to consumers all the finest of their fruit at good prices—indeed, had been unable to supply all orders. The people thought this society should hit upon a plan by which people of the village could be supplied with the best fruit, and it was thought by several that a system of ordering through the society could be arranged.

June Meeting.

A large attendance and a good time were the characteristics of the June meeting of the pomological society, at Geo. T. Lay's, in Monterey, the only preventive to perfect enjoyment being the unusual coolness of the air. Over twenty members or visitors were present, the ladies and Mr. Lay's family making the number up to about fifty.

Mr. Lay's farm is a large one for this region, consisting of 520 acres, much the greater portion being under cultivation, well tilled, fenced, and fertilized. There are great stretches of meadow, large wheat and corn fields, a ten-acre apple orchard perhaps not equaled in condition by any in the county, and a large peach orchard, a part of which, about one acre, was among the first planted in this vicinity, the profits from which induced the growing of many another. The younger trees of the tract are now well filled with fruit. Mr. Lay does not seem to give particular attention to stock, to the raising of which, however, his farm is well adapted. There are several large and well-built barns which at the right season bulge with the wealth of fields and render it up as a reward of the summer's toil. A pleasing feature of the premises is their perfect repair and cleanliness. The house is a large and pleasant one, comfortably furnished, and in a way that seems to show that it was meant to be a home rather than a mere dwelling-place. Therein Mr. Lay, with his wife and several daughters who flocked home at call, entertained the company with courteous generosity, supplementing on the ample board at noon the contents of the lunch baskets, sufficient though they were, with toothsome delicacies and substantials, and serving them with thoughtful care.

After dinner the company gathered in the spacious parlors and after some matters of business were disposed of, engaged in discussion, President Dumont being in the chair.

Chas. Manwaring said: The great drawback to successful farm gardens is lack of time, as their contents require more attention than do farm crops, and none but the owner will do the work properly; hired men will not do it. First, a forcing bed is necessary to a good garden, to start plants early, that the farmer's table may be supplied as soon as that of the city dweller. As soon as the ground can be worked, plant seeds of the vegetables which are not hurt by frost and follow with others as the season advances. But without thorough cultivation all else is of no avail. Every garden should have its currant-patch and its strawberries as well. Plants of the latter sort set one year, cultivated, and the runners kept back, will the next year produce plenty of berries.

H. G. Buck: I have been, during my life, very successful at gardening, and considered that my garden furnished half my living in summer, and the best half. But now hens pull up the turnips, and what they miss of the cabbages the worms eat up; I have planted peas in hills and drills, and moles go under and take every one, and finish up with the sweet corn; the white grub takes off the onions; of cucumbers and melons I get a few, but I have lost faith. This year I got a few peas up and the rabbits took them. So I have had a quite successful failure again.

Mr. Manwaring: I put everything into long rows so as to use a cultivator, and always have success.

T. J. Strong: A good garden will afford half the family's living, but it is almost impossible to get it. I remember when I only had to plant and cultivate to be sure of success, but now the season is often bad and I have to war against worms and bugs. Have tried squashes several years but failed until last year, when I threw dry ashes on the plants as soon as they came up, and so got a crop.

One member had got a fine crop of winter squashes among field corn. So had another, but the bugs found them out the second season. Another said last year squashes succeeded everywhere.

Mr. Buck: Saltpeter water (a tablespoonful to a pail of water), sprinkled on the vines will kill squash and cucumber bugs, and solution of carbolic acid will kill cabbage worms.

S. P. Warner: Many plant too soon. Corn should not go in till the apples bloom. For peas plow the ground in the fall, drag in the spring, plow a furrow, sow peas in it, turn a furrow, and plant in the next one, roll down. They are then in so deep that neither moles nor drouth will harm them. I plant all in rows wide apart so as to cultivate with horses. Frequent hoeing and deep cultivation are the secrets of successful gardening.

M. T. Smith: If a plan can be hit upon by which farmers may have good gardens it will be very important. I have the habit of going to the garden to work after supper, and find it real pleasure. If moles trouble in one spot move to another. The soil should be deep, rich, and mellow, plowed in the fall. When the seed starts work has just begun. Use hoe or rake as soon as the sprouts appear. Have a fixed hour for garden work, either in morning or evening or both. Wrap paper about tomato and cabbage plants and cut-worms cannot reach them. Don't set a day for garden work, for you are sure to postpone it.

Geo. T. Lay: I had no trouble last year. Used hen manure in all hills and drills and worms and insects avoided it, except the cabbage worm.

Mr. Manwaring: Hen manure is next to guano as a fertilizer and invaluable for vines.

CULTIVATION OF SMALL FRUITS.

Mr. Buck showed samples of the Seneca Chief, Seth Boyden, Crystal City, Sharpless, and Shirts strawberries. Relating his experience in strawberry culture he said that five years ago he got at Plainwell roots of the Kentucky, Emperor, Seth Boyden, Seneca Chief, and Charles Downing, 250 in all, set them out, and they had supplied him with berries ever since, though they have had no cultivation for the past two years. The Kentucky will grow and bear a long time, and do well even if neglected. It is the lazy man's strawberry. [Every member inquired for plants.] It is a late berry and of good quality. The Crystal City is early and good. E. P. Roe says the Crystal City is the earliest, the Glendale the latest, and the Sharpless the largest of strawberries. The Sharpless winter-killed badly, but of the Crystal City not so many as of the Wilson. I think the Shirts berry equal to the Wilson in shipping qualities and superior to it in flavor. It was originated by E. Shirts of Shelby, Oceana county, and was named by vote of the State Pomological Society at Muskegon two years ago. It is an easy thing to have a strawberry patch. If you have a rod of ground you can have berries, whether it is sand or any other soil, even if white clay. Set the plants in clean ground prepared as for corn. If in a field set four feet apart so as to permit the use of cultivator or drag. Turn the runners so that they will not spread more than a foot, let them set, and you will have what is called the matted row. For garden culture set eighteen inches apart and let them mat together. They will last so several years. Then change to a new patch. From a patch one rod by three my family has berries three times a day and we can large quantities besides.

Mr. Manwaring: May 1st get plants with white roots as they are new and have not yet fruited. The land should be good old sod or well manured. Plow in the fall and use a spring-tooth harrow, cut back the roots, leave one leaf, plant as you would cabbages, cultivate and let the runners alone after the first harvest; turn under after one crop. Before turning under take the runners and set a new patch, doing so each year.

Mr. Buck had found that black roots grew as well as white.

S. Rumery: I have supposed stawberries could not well be raised on such heavy soil as mine, but in the light of Mr. Buck's statement I shall try a patch next spring.

J. H. Wetmore: If Mr. Rumery had ever tried strawberries on heavy soil he would have found that it beats sandy soil altogether. His first patch of eight rows three rods long has yielded for sale as high as six bushels besides a liberal supply for the family. There is no trouble with a garden when it is well cared for, but it was only in a few cases that he had found the right sort of a man for gardener. Englishmen and Dutchmen make good gardens but he would never hire a Yankee as a gardener.

Mr. Smith: My neighbor has an Englishman at work for him, who makes a good garden, going to it after supper and early in the morning, from a liking for it. I don't know whether he receives extra pay.

Mr. Wetmore: My ground is very rich naturally, and when I put out my strawberries I put under four inches a heavy coat of old manure.

Mr. Buck: It pays to keep strawberries clean, but it is a mistake to suppose they will not bear at all unless kept scrupulously clean.

Mr. Wetmore: Some Wilson's I put out 26 years ago still bear though the berries are likely to be small.

Mr. Sweezy: I have strawberries growing in grass, having not much care if any, bearing nice large berries. I think they are better for having a little shade.

Mr. Manwaring: They will be as large but not of as good quality.

Mr. Buck: Except the raspberry I find no fruit which does as well in shade as in sunshine. Eight or ten years ago I was much astonished at seeing in a neighbor's yard cultivated raspberries. I began getting a few and soon had several hundred purple-canes and black-caps and have sold from five rods of land to purple-canes, $5 worth per year. I now have Davison's Thornless, an early, sweet variety having no briers; the Philadelphia is a great yielder but the fruit is of poor quality; the Clark, red, of no consequence, the fruit being soft and the yield small, not fit for shipping; the purple-cane having similar characteristics but very hardy; the Miami, black, sweet, and very large; the Gregg, a fine black-cap, of which Purdy says his pickers get in the same time two quarts to one of any other sort, some berries measuring from three-quarters to an inch across at the base when ripe: the Cuthbert, which Roe says is most prolific of the reds; the Lost Rubies or Naomi, one of the best reds; and the Turner, red and hardy. It is the duty I believe of every farmer to have a supply of the delicious and healthful small fruits. If you will not cultivate them as you should, put them off in fence corners or other waste places; but by all means have them. I do not counsel neglect, but the berry vines and canes will grow even if neglected. I tie black-caps to stakes. I set in the spring and grow from one to six canes one to two feet long, then nip off the ends and they throw out side shoots. New plants of the black-cap are obtained by rooting tips and of the others by digging suckers. I nip off the new canes of each year at twenty inches. Drive stakes in April, and after the old canes are cut out tie up as near to the top as possible. On strong soil canes nipped back in this way will grow so stout as to need no stakes. If tied in the fall the twine is likely to rot by spring and let the canes down at time of fruiting. I cover the tips of all good canes in the fall and they take root and brace the cane against winter storms. The blackberry succeeds the raspberry and goes on through the season by using different varieties. They are easily raised and profitable. One year, from a row ten rods long, I sold $6 worth and had enough besides for family use. I have picked from Kittatinny as late as November. The free use of these berries is highly conducive to health, and they afford most delicious fare. If you haven't them and won't raise them swap off a half barrel of pork and buy. The berries take better than the pork and will make you feel better

Mr. Wetmore: The first raspberries I planted were wild ones taken from the woods. I put out several rows, laying logs from ten inches to two feet thick along each side of the rows, and for years, without further attention, I had an abundance of fruit. Some are there yet, and other than those in their prime I have never seen berries larger nor of better quality.

Mr. Manwaring: There are two systems of raspberry culture, one with nipped canes and one with long ones. Both have merits, but for the farmer the latter is the cheaper way. Tie up the canes in the fall to low stakes and let them bend over, trimming off the long ends.

Mr. T. Smith: Three years ago I got several hundred raspberry plants and set them six feet apart as they do at Plainwell. When the canes got their growth they were close together, my soil was so strong. Should I plant again in such soil I would not leave more than six canes in a hill, nip back at two feet, and leave them without stakes. The berries are then all on the upper surface. Cultivation is essential.

Mr. Buck: I raise raspberries between rows of peach trees, with no perceptible damage to either. I have had rust, a disease of the leaf; have seen it on wild plants and on my Doolittles it was very bad. Salt is said to be a cure for it. Rust is bad this year.

Mr. Smith: Rust shows first in the growth of clusters of small leaves, then the rustiness appears. The disease seems to be contagious. I put on salt this year and no rust has yet appeared. For a family patch I would set Taylor's Prolific, Purple-Cane, and Turner. Brandywine is the best red for market, being hardy and bearing transportation, but it yields scantily. The Miami and Mammoth Cluster are also good for the family patch, for table use the Miami being hard to beat.

THINNING PEACHES.

T. W. Sithes showed limbs from Early Louise, Early Rivers, Barnard, and Late Crawford peach trees, all in full bearing and health, showing no signs of curled leaf so prevalent this season. He thought the Early Crawford would mature more peaches than some other varieties, and would this year need no thinning or but little.

Mr. Buck: I would thin about July 10, as by that time the rose bug is out of the way.

Mr. Wetmore: It should be done now, as soon as possible; by all means before the pits harden, as that process is what exhausts the tree.

Mr. Rumery advised thorough thinning for well-known reasons, as also did Mr. Lay, saying that not more than one-third of the fruit now on Mr. Sithes' trees should be left there. They should be left several inches apart and picked off from the under side of the limbs, as fruit grown on the upper side is always largest and of the best color.

The society adjourned having had one of its largest and best meetings.

July Meeting.

Last Tuesday the society met at the home of Robert Campbell, Allegan township, and despite a little misunderstanding as to the date there was a good attendance. Mr. Campbell's home is that of an industrious, intelligent, and well-to-do farmer, of a kind that is becoming numerous in our now wealthy county, and presents an air of thrift and comfort bespeaking prudent use of the results of early years of labor. The house is nicely furnished, and the farm, a rich tract, is supplied with all the accessories of machinery, choice stock, good buildings, and abundant orchards. Mr. Campbell is one of the chief growers of peaches in this vicinity, and his well-kept trees now have a good supply of fruit promising rich returns for the season's work.

After enjoying a picnic dinner under the big cherry trees the society was called to order by President Dumont and proceeded first with matters of business. Mr. LaFleur reported the following as the programme for the August meeting: "Horticultural and Pomological Societies as Educators," Rev. J. Sailor; "Home Adornment: Its Influence Upon the Family," Helen M. Peck; "Have we Made any Progress in new Fruits?" G. H. LaFleur. L. A. Lilly was appointed a committee on programme for the September meeting, to report in August. The August meeting was appointed for the third Tuesday, the regular time, at J. B. Dumont's. The committee on transportation was given one month's more time in which to report. J. B. Buck showed samples of red raspberries, the Cuthbert (red) and Gregg (black), both of which showed good qualities.

Taking up the subject of "Stock in the highways," Mr. Buck read a paper by S. B. Mann in the Pomological report for 1881, which urged the point that while the laws made by our Legislature are unsatisfactory or worthless, no statute is necessary, as the constitution makes ample provisions. Says Mr. Mann:

The constitution allows of no law that will tax one man for the benefit of another as an individual. The government deeds the individual a certain number of acres and guarantees to him all the rights and privileges therein, reserving only the power of laying along his boundary line or through his land highways, or what may be better called "public ways." Notice now that nowhere in any act whatever is there any such term as public pasture, but "highway" is the term, meaning a passage way for the public. Free and unrestrained is any person who chooses to peaceably pass, but he has no law, nor can there be any law enacted or enforced, that allows him any other privilege than that of passage. The owner of the land is required by the State to furnish the land for the road and he is taxed every year on that with the rest of his farm. Not a tree or a shrub or anything else that grows or is found there can be used or converted to the use of any private citizen other than he who owns it. Any tree or grass growing on the highway is as much the property of the owner of the land as though it were inside his enclosure, and any other person appropriating it to any other purpose than to benefit or repair the passageway—and that officially—is a trespasser in the full meaning of the term. It seems to me that when this can be fully understood there need be no more trouble. Stock found grazing in the highway, with no escort or person to drive it along, is trespassing, and should at once be shut up and the owner made to pay for all the trouble before he can take it.

Mr. Buck then read the following paper:

Shall our stock run in the road? I answer, No. And why not? Because they have no right there. Every man who buys a farm pays for the land to the center of the road, and it is his property just as much as the land in his orchard or dooryard. I paid $75 for the land, three acres, now in the road in front of my farm. What right has my neighbor to make a hog or cow pasture of that land? I have greatly desired to set maple trees along the road, but I could not unless I built a fence around them to protect them, to do which was too expensive. It is a great annoyance: (1) to the one who owns the stock, for when he turns them loose in the morning he does not know where they will be at night —they may be at home, or five miles away, or in somebody's crops; (2) it is a still greater annoyance to others—as for myself, I can not leave a gate open, day or night, summer or winter, one minute, for fear some cattle will be at my fruit trees, or up to some other mischief; if I wish to draw hay or grain I must open and shut two gates, if it is twenty times a day, and if the snow is four feet deep I must shovel out and shut up; (3) it is very expensive—when I bought my lot it was bounded on three sides by roads and commons, and a marsh of ten acres ran through the center.

When I had a fence around the marsh I had a good pasture and that was all the fence I needed except a barnyard fence and a lane to the marsh. But to make a long pasture for my neighbors I had to put a fence around the whole farm—280 rods of fence for other people's accommodation, and after all this I have had my potatoes rooted up, my clover rooted up, my wheat a tangled mass, almost impossible to cut, and I have run after other people's cattle and hogs more than I ever shall again. "Well," says one, "what shall be done?" I say club together and throw down road fences (which cost the State more than $2,000,000 annually), fall back on the constitution of this State, and tell those who wish, to let cattle run if they think best. I know this is strong talk but I have suffered so much that I believe in taking this matter by the forelock.

W. T. Smith said it was really not much of a job to cause the restraining of stock. A few years ago they tried in Hopkins to get the town meeting to vote that cattle should be kept out of the streets, but they failed. Those who opposed most strongly were best able to keep their stock on their farms. A petition was made to the supervisors and they passed a resolution restraining stock in Hopkins. There was much talk of opposition, but after a few seizures of straying cattle there was no more trouble. Then owners in neighboring towns grew wroth but were quieted by the same process of stern enforcement of law. The law has now been changed so that the supervisors have to vote to allow stock to run instead of voting to restrain it. Any person may take up stray stock and deliver them to the pathmaster of his road district, who is by law obliged to receive, advertise, and if necessary sell them. Farmers may detain stock and collect damages for trespass. In Hopkins crops are in many places grown close up to the track in the highway.

Geo. T. Lay said: This is the first year the subject has been agitated in Monterey. There is some opposition but they expect to come out all right and keep the stock shut out of the roads.

M. T. Smith: Any person taking stock from the pound unlawfully may be prosecuted as a thief.

J. H. Wetmore: I am my own poundmaster and I have educated half of Monterey on this question this spring. Much trouble comes from bad, conflicting, statutes. The constitution says in effect, that the land in highways belongs to the owner of adjacent land, while the legislature has undertaken to say the supervisors may make free commons of it. The way to rid ourselves of the stock-at-large nuisance is to "talk square," take down our fences, and put cattle into the pound. All that is necessary in taking up stock is to notify the owner if known, if not, post three notices to the effect that you have taken up such stock, describing it.

W. H. Ely read from the pomological report of 1877 figures showing the great cost of fencing. It was estimated that the fences, if built of boards, in an ordinary township would cost $129,600. The interest at seven per cent, wear and tear, and repairs amount to $24,624 per year. Presuming that ten per cent profit may be made on stock raising, to pay this annual cost would require the profits from $1,000 horses worth $100 each, 4,000 cattle at $25 each, and 15,413 sheep at $3. These figures include the cost of division fences as well, but serve to show important facts.

J. H. Wetmore: Each farmer may have pasture enough for his own stock by using a movable fence, and the interest on the cost of other fences will pay the expense of shifting the movable one.

M. T. Smith: We are obliged, not to fence other stock out, but to fence our own in.

With but one dissenting vote, that of Mr. Wetmore, who said no resolution was needed, the society adopted the following:

Resolved, That we will remove our road fences and unite in enforcing laws against stock running at large, and maintain our constitutional rights to our own land.

August Meeting.

Mr. Dumont called the meeting to order, and J. Tomlinson was elected secretary pro tem. Reports of committees were omitted, the members not being present.

The Rev. John Sailor read a paper entitled "Horticultural societies as educators."

Mr. Buck liked the sentiment of the paper. People could learn much by reading. Fruit and crop reports are valuable. An instance was given of a man who lost $800 by giving no heed to them, while another made a large sum by trusting to them.

Mr. Sailor: The trouble is we do not read the papers that give the reports. We do not always have the courage of our convictions. Every man should use his own judgment. I would recommend the Rural New Yorker as very reliable.

Mr. Peck: We must have experiences of our own. Books and papers do not make up for personal experience.

Mr. Buck: We do not always have confidence in books and papers, and sometimes we have too much. Most of the papers have an ax to grind, but the experiences of those who give them at these meetings are more reliable.

Mr. Sailor: Our own experience costs oftentimes too much.

An essay, "Home adornment: its influence upon the family," by Helen M. Peck, was read by her father, Miss Peck not being present. This also is reserved for future publication. The paper was well received, but was not discussed.

A vote of thanks was tendered the Rev. Mr. Sailor for his excellent address.

"Have we made any progress in new fruits?" a paper by Mr. LaFleur, was next presented. In a general way the speaker claimed that we had. All of the fruits of the present day are far better than their originals years ago. This progress has been made largely by cultivation, but also by nature's own processes. Soil and climate are important factors in the development of fruit. The paper was general in its tone, the speaker studiously avoiding mention of particular instances wherein improvement could be shown.

Mr. Rumery did not indorse all the paper by any means. As to peach trees, forced cultivation has nearly ruined them. Peach trees used to live thirty to forty years, while ten years is now about the life of the tree.

Mr Buck objected to the paper in this: that when the speaker got Adam out of the garden he did not get him back again; but on the whole was well pleased with the paper. He named several varieties in which great improvements have been made. Mr. Buck finds great pleasure in cultivating new fruits and has generally been well repaid for his efforts in that direction.

Mr. Lay called for more particulars, the paper was too general.

Mr. LaFleur—Sometimes what we write gets into the papers, and we do not always hear the last of it. It is almost impossible to discriminate justly in regard to rare fruits. How many of us have had our expectations realized in trying new fruits? The peaches which are now doing us the most good are raised in our own county. We deprecate efforts of eastern nurserymen in the extraordinary attempts they are making to force their goods on the public, and the extravagant praise of them in their advertisements. We claim that we have several new varieties of peach which have originated in this country, and about which we are making no noise, but which are really as valuable as the eastern stock that is so highly praised, and for which such extravagant prices are asked. There are several varieties not yet named which we consider very valuable, embracing a seedling originating with Mr. Corner, a peach originating on Frank Granger's farm, the Stranahan, a very fine late peach, the Lewis, a seedling from the pit of a Hill's Chili, and another seedling larger than the late Crawford. There is no need to go out of the county for good stock, nor to pay the large prices asked for foreign varieties.

Mr. Lay considered this talk of Mr. LaFleur the best part of his paper.

Mr. Thompson mentioned a new black-cap raspberry, remarkable only for its extreme earliness and vigorous growth.

Mr. Buck talked about strawberries, and gave his experience with several new varieties. He thinks the Glendale makes the best preserves, and spoke highly of the Shirts berry.

Mr. Peck said he thought some of Mr. LaFleur's remarks were more practical than his paper.

Mr. Buck talked of raspberries.

Mr. Lay reported about marketing fruits; can get rates fixed at about $1.10 per hundred to Milwaukee, by rail and boat, without delay, but had made no definite arrangements.

The programme for the September meeting was not reported, but will be published in time.

Moved that J. Dumont be appointed a committee to report at the September meeting the subjects of discussion for the October meeting.

Some discussion was had in regard to competing for the State fair premium of $50 for the best collection of fruits, but no definite action was taken.

Moved to meet at the Lonsbury grove in Watson as a picnic meeting at the next meeting.

Some remarks were made about the yellows in peaches, the drift of which was that it was a very serious matter, and the losses this summer very heavy. Mr. Dumont thought the largest and best-cultivated orchards are the least affected by the yellows. Mr. Peck read a paper by S. Rumery on the peach, the leading idea being that yellows is caused by forced cultivation. Mr. Dumont thought differently, and Mr. Buck concurred with him, and claimed that peaches growing on the poorest soils are most affected by yellows. Mr. Buck thought yellows were propagated by the pollen of the flowers. Mr. LaFleur said that pits from peaches affected by yellows will not grow. Various views were expressed in regard to the cause of yellows, but no one gave what he considered a sure remedy.

September Meeting.

A meeting of the Allegan County Pomological Society was held in a grove at the Miner school house in Watson, Tuesday, September 19. The fact that the meeting was noticed in but one of the county papers, a misunderstanding arose with many as to the time, and the day promising a rain but few attended. After sampling and discussing a few choice peaches and pears brought there by Wm. B. Andrus, the meeting was called to order by the president of the society, J. B. Dumont.

The secretary being absent, A. J. Bracelin was chosen to report the meeting.

[This meeting was given up entirely to the discussion of the yellows, and as no new facts were brought out, the minutes are not inserted here.—SECRETARY GARFIELD.]

MANISTEE COUNTY HORTICULTURAL SOCIETY.

ORGANIZED JANUARY, 1883.

This society was organized just in season to take its place in this volume, with the following

OFFICERS FOR 1883.

President—Ed. Russell.
Vice President—S. W. Fowler.
Secretary—Jos. V. P. Mukantz.
Treasurer—Peter J. Mukantz.

List of Charter Members—Ed. Russell, Jos. V. P. Mukantz, Peter J. Mukantz, A. V. McAlvey, App. M. Smith, David McNabb, D. E. Sibley, G. T. Alanson, P. B. Fisk, Wm. Altman, Wm. Jewell, A. O. Ward, C. D. Gardner, Chas. M. Lyon, W. D. Horton, A. O. Wheeler, B. M. Cutcheon, T. J. Ramsdell, Edwin E. Benedict, Geo. A. Hart, S. W. Fowler.

OAKLAND COUNTY HORTICULTURAL SOCIETY.

ORGANIZED FEBRUARY, 1883.

Pursuant to a call, a number of Oakland county people met in the court house in Pontiac for the purpose of organizing a county horticultural society. Byron G. Stout was called to the chair and E. J. Kelley acted as temporary secretary. Secretary Garfield gave an account of the work of the State Society and its auxiliaries. A. L. Aldrich, secretary of the Genesee county society, was called upon, and addressed the meeting upon the usefulness of county organizations in the interests of horticulture, and gave an outline of the work of his own society, supplementing the account with valuable statistics of the fruit products of Genesee county.

On motion of Mr. Wyckoff, the meeting proceeded to form a permanent organization, adopting a constitution, and selecting the following officers for 1883:

President—S. Van Hoosan, Rochester.

Secretary—I. B. Merritt, Pontiac.

Treasurer—H. A. Wyckoff, Pontiac.

Vice-Presidents—Emmet Green, Farmington; G. A. Terry, Avon; Jos. A. Graley, Bloomfield; Frank Miller, Groveland; O. L. Murray, West Bloomfield; Wm. Caldwell, Commerce; George Green, Oakland; Josephus Smith, Troy; Geo. King, Independence; G. M. Shattuck, Pontiac; Jackson Voorhies, White Lake; Robt. Soults, Royal Oak; C. V. Babcock, Southfield; Gad. Chamberlain, Addison; C. Lockwood, Highland; C. E. Dewey, Waterford; H. A. Kipp, Milford; A. J. Crosby, Jr., Novi; Henry Winkley, 1st ward, Pontiac; W. L. Coonley, 2nd ward, Pontiac; John R. Taylor, 3rd ward, Pontiac; B. G. Stout, 4th ward, Pontiac; B. P. Miller, Groveland.

There was a creditable show of fruit by A. E. Green, of Farmington; O. H. M. Huested, Holly; and an especially fine lot of Baldwin, Red Canada, and Jonathan, by Mr. Stout. Vegetables and Amber Cane Syrups were shown by Henry Winkley, Joseph Graley, Mr. Huested, and others.

The society started out with a membership of twenty-five, and a promising future.

SOUTH HAVEN AND CASCO POMOLOGICAL SOCIETY.

PREPARED BY SECRETARY RAMSDELL.

The South Haven Pomological Society was organized September 30, 1873, and has held weekly meetings (with a few exceptions), for discussions of all questions pertaining to the interests of fruit culture and marketing all kinds of fruit grown in this vicinity. As the business increased from time to time it was evident that the larger part of the fruit shipped from South Haven was grown in the town of Casco in Allegan county. It was therefore deemed best by a large majority of those present when the new society was organized to include Casco, and the name of the "South Haven and Casco Pomological Society" be adopted. It also includes the towns of Covert, Geneva, and Columbia in the county of Van Buren, and Lee and Ganges in Allegan county. Under the new organization there were 64 members for the year 1882, of which twenty were auxiliary members to the State society. The society has never been in a more flourishing condition nor ever has it done more credit to itself in its discussions than in the year 1882.

There has been a very decided improvement in the cultivation of small fruits and the marketing of all fruits shipped from this port. South Haven fruit has a reputation in the market and is being sought for by those who know good fruit and are willing to pay a liberal price for it. The advantages of our location are apparent to all who have fruit to market, and are highly appreciated by the fruit-growers in this vicinity.

That dreaded scourge of the peach-grower, "yellows," has made slow but marked progress during the year in this locality. This question has been pretty thoroughly ventilated before this society at different times the past year with beneficial results. The law has not been observed as closely as it should be in the matter of cutting and burning the trees "at sight," nor yet in the shipping of partially diseased fruit. After all a great majority of the leading fruit-growers fully believe that as a rule those who have cut out their trees at once as soon as discovered, have not only got the most trees left, but have for a term of years lost a much less percentage than those who have allowed their trees to stand through the season in order to pick what fruit they were able to obtain before cutting the tree down. A large majority also believe that the disease can be kept in check if all fruit-growers would dig out and burn all trees as soon as they discover the disease.

The South Haven and Casco fruit-growers are prospering as a whole, and "yellows or no yellows" they will continue to raise fruit as successfully as any location in the whole northwest if they do their duty in the cultivation as well as they know.

The year 1882 was on this shore as a whole one of the poorest ever experienced. There were no average crops of any fruit except blackberries and Black Cap raspberries. In some localities peaches were a full crop, and also pears, but as a whole they were short. Apples, red raspberries, and plums were a failure. Grapes were injured by the May frost, and more yet by the rose chaffer, and only a few average crops. The indications for the crop of '83 are all right now, the buds being in good condition when cold weather commenced and no warm spells to swell them and no extreme cold, ten degrees below zero being the coldest. There will be more peach trees and grapes planted this spring in this place than ever before in one year.

The annual festival of the Pomological Society was held as usual and there was a large attendance of fruit growers and their wives and children, who came well laden with baskets of palatable food. Happiness beamed from every countenance of the one hundred and more who were present, and perhaps in no former year did the Society hold such an enjoyable festival.

After President Phillips had called the meeting to order, he stated that a matter of business concerning the proposed amending of the by-laws required attention.

On motion of Mr. Gully it was then resolved to change section six of the by-laws so as to make the term of office of the society officials and the membership commence and end with the calendar year.

This finished the business and the intellectual feature of the evening commenced. The president called upon Mr. Henry King, who read the following essay on

THE HEMLOCK SPRUCE.

Upon occasions of this character it is probably expected that topics pertaining to fruit growing shall be presented. If I deviate from this custom perhaps the briefness of the article will be accepted in excuse.

Allow me for a moment to ask your consideration for one of our evergreen forest trees, the hemlock spruce—a tree regarded by many as standing with but few rivals among the list of coniferous trees. A wealthy farmer in the interior of the State whose grounds are filled with beautiful trees, has made more than one journey into this county to procure small trees of this variety, taking them home, placing them in nursery rows, and, after cultivating one or more years, then transplanting where they are to remain permanently as single trees or in ornamental hedges. A short time ago a gentleman living near one of the finest towns in this State, engaged in growing and handling evergreens, called my attention to an ornamental hedge formed of the hemlock, which he described as one of the finest in that town noted for its beautiful trees and ornamental hedges. It is often said that we do not prize our privileges until deprived of them. However this may be, I think one realizes the beauty of our forest trees as never before, after a sojourn on the treeless prairies. The dwellers in those regions, aware of their privation, are earnest in their efforts to supply the deficiency. As an evidence of this, I may mention that I saw in a western prairie town a couple of Norway spruce evergreen trees, but little higher than a man's head, which the owner procured from a distance of sixty or seventy miles at an expense of fifty dollars—such trees as we can have almost without money and without price. Perhaps there is no tree that flourishes under more diverse circumstances than the hemlock. We find it in a state of nature on the highest and most barren soils; upon the deepest and most fertile; upon the dryest hills and in the wettest swamps. This community is keenly alive to a love of the beautiful, as we see attested by the many magnificent trees filling the yards and surrounding the homes of this section; yet, of all these fine specimens it is safe to say that not one in a hundred is of this variety. The question recurs, why is it that a tree so easily obtained, so hardy, so nearly unequaled in form and color, should be so much neglected? Is it because it is so common? If so, this reason will soon cease to exist, for the woodman's axe and the devastating fires are rapidly sweeping these monarchs from the land. And, even now, in sections that have been cleared but twelve or fifteen years, the only specimens remaining are those found in inaccessible ravines or impenetrable swamps. Patriotic feeling should prompt us to take measures to preserve specimens of this grand tree before it is too late. Then, let us resolve to give them place in our grounds as single specimens, groups, and ornamental hedges.

Mr. S. G. Sheffer was next called upon and read an essay on

HUMAN PROGRESS.

The essay was a splendid production, giving the most sublime thoughts in chaste and elegant language. Nothing short of a full report would do it justice, and this would compel us to omit some of the essays having a more direct bearing on practical pomology and kindred subjects.

The president then called upon Mr. D. B. Williams, who gave the following

REPORT OF YELLOWS COMMISSIONER.

In 1879 he had examined 62,856 peach trees, and of these 2,245, or 3½ per cent were diseased with the yellows. In 1880 he examined 68,757 trees, and found 5,674, or a little over 8 per cent, diseased. In 1881 he examined 71,353 trees, and found 3,256, or 4½ per cent, diseased. And in 1882 of the 120,425 trees he examined, only 4,544, or less than 4 per cent, had the yellows.

Hon. A. S. Dyckman was next called upon by the president, and his response in rhyme was greatly enjoyed by the audience.

The president then called upon Mr. Joseph Lannin, who delivered an excellent speech on the

CIVILIZING INFLUENCES OF FRUIT GROWING.

Mr. Lannin first alluded to the number of societies in this place. A little over a year ago the Messenger had suggested the propriety of organizing an antiquarian society and the suggestion was accepted by a number of gentlemen, the consequence being that South Haven has now a very flourishing Antiquarian Society. He referred to the Pomological Society as an evergreen one, which bloomed the year round, and alluded to the benefits it has conferred upon fruit growers. He claimed that those nations who had attained to a high degree of civilization were fruit growers, and in proof of this he referred to India, whose people live on fruit and vegetables. The history of the musty past shows that India had attained to a high state of civilization. He cited Egypt, Greece, the Valley of the Euphrates, and other eminent fruit growing countries in the east that had made marked progress in the arts and sciences, and contrasted these powerful nations with the carnivorous hordes that inhabited the high lands of Asia, leading a nomadic life, with no schools, no laws, and no advancement in civilization. In conclusion Mr. Lannin referred to the intelligence and spirit of progression so characteristic of South Haven and the surrounding fruit growers, and spoke of the great benefit pomologists derived from the weekly meetings of the society.

The President next called upon Mr. H. J. Edgell, who read an essay on

GOOD ROADS,

Which was full of practical ideas concerning road making.

Mr. J. H. Ramsdell followed with an essay on

POMOLOGY AND POMOLOGISTS.

Mr. Ramsdale first referred to the struggles of inventors and their persevering self-sacrifice, showing that every thing of value cost labor and treasure. He claimed the true pomologists are not the newspaper writers, theorists, farmers, etc., but the men who give pomology their undivided attention. The great trouble with South Haven pomologists is to be found in the fact that they raise grain, bees, etc. Too many of the members of the society are engaged in other business, but those who pay strict attention to pomology are the most successful. The society needs a larger regular attendance and more interest manifested in its discussions. He advocated the starting by the society of a small experimental fruit farm on which new varieties of fruit and different methods of cultivation could be tested at the expense of all the members.

The president then called upon Mr. A. D. Healy, who read a very excellent paper on the seed growing industry, in which he showed that the lake shore was a peculiarly favorable locality for seed-growing as it was for developing the flesh which encloses the seeds. He gave the localities in which divers seeds are successfully grown, and claimed that for most classes of seeds the locality of South Haven is admirably adapted. He had been experimenting for two years with several sorts and was well satisfied with his success.

Mr. Boardman, of Chicago, was next introduced to the audience, and he made a few remarks concerning the rapid progress made by South Haven and vicinity, after which supper was announced.

The tables extended the entire length of the large hall and were loaded with the substantials and luxuries of life. Indeed it was a palatable repast such as is rarely spread, and reflected great credit upon the generosity and cuisine knowledge of the ladies. The viands were highly relished, and this portion of the evening's programme was certainly not the least enjoyable. After the audience had done ample justice to the delicious food provided, in response to loud calls for him, C. J. Monroe made a few encouraging remarks concerning

THE YELLOWS.

Mr. Monroe said that all recognized the peach as the king of fruits, and statistics show that nothing as profitable as the peach grows out of the ground. The past thirty years have demonstrated that no other crop grown on this lake shore has been as profitable as the peach, and he thought the prospect was cheering. He does not feel like taking the "blues" over the yellows, which has been operating unfavorably for years. He is satisfied that notwithstanding the yellows, peach culture can be pursued profitably. The only course to pursue is to take out and destroy trees tainted with the disease root and branch, planting young ones to take their places. The experience of St. Joseph with the yellows is not a fair criterion. In St. Joseph the growers did not know the disease, and permitted the affected trees to stand until their whole orchards were destroyed. The figures of the yellows commissioners show that the disease is on the wane here, and he thinks everything looks promising for the peach-growers of South Haven.

On motion of A. S. Dyckman, C. J. Monroe was requested to further investigate the subject of yellows and peach culture, and submit an essay thereon to the society.

On motion, the thanks of the society were tendered Messrs. French Bros. for the crockery and glassware used at supper, after which the meeting adjourned.

THE SECRETARY'S PORTFOLIO.

JAMES VICK.

James Vick was born in Chichester, England, November, 1818, and died in Rochester, New York, May, 1882.

No man has ever lived and died in our country that has left so beautiful and so permanent an impression upon the homes of our people.

THE SECRETARY'S PORTFOLIO.

INTRODUCTORY NOTE.

Again, during the year 1882, I have been gathering from every available source facts, observations, experiments, and opinions in the field of horticulture, and from the great amount of material garnered, I have sifted and pruned, abstracted and epitomized, placing the results of this long and oftentimes perplexing labor in the condensed form which follows this prefatory note. A very large amount of very valuable information has been thrown out, not because it was unworthy, not because it was uninteresting, but for the reason that everything could not be taken, and it was desirable to get such matter as would interest and instruct the largest number of inquirers.

I have again this season been met by this difficulty, that the work could not be distributed through the year and thus become better digested. Many of the papers received with valuable articles early in the year remained unopened until December. Again, there will, I know, be many disappointments when this volume reaches its readers, because many friends have sent in notes and essays during the year expressly for the Portfolio, which I have not used. For seven years I have edited this report, and in each one there has been a gathering of horticultural matter similar to this. Now in all these years a great many topics have been treated, and a large number of facts and experiments recorded. It is not desirable to duplicate these, so in many cases I have thrown out excellent articles sent in because in previous years I had been attracted by the same ideas and preserved them in former reports.

As the years go by it becomes more and more difficult to select matter for this section of the volume without duplicating material already saved, and there is little doubt but that I have used the same things more than once from a lack of time which should be given to the compilation. In this edition of the Portfolio there are above 200 articles gleaned from periodicals, books letters, and conversations. More work has been given to condensing than in any previous year, still it is very far from my ideal; in truth I am more loth to have it leave my hands than ever before. I trust that those who read and see faults in the compilation will freely communicate with me concerning the future scope and arrangement of this feature of our reports, not forgetting when they criticise that although I am always glad to get suggestions, I am also hungry for facts.

The newspapers have been my most valuable aids in building the Portfolio, and I take pleasure in naming those from which I have gathered material for the structure.*

NEW YORK TRIBUNE, RURAL CANADIAN, RURAL NEW YORKER, NELTNOR'S FRUIT AND FLOWER GROWER, WESTERN FARMER, VICK'S MAGAZINE, Gardener's Chronicle, London Garden, OHIO FARMER, Boston Journal of Chemistry, FRUIT RECORDER, COUNTRY GENTLEMAN, New York Times, American Naturalist, PRACTICAL FARMER, Farm and Garden, AMERICAN GARDEN, GRANGE BULLETIN, INDIANA FARMER, Ladies' Floral Cabinet, GARDENER'S MONTHLY, Post and Tribune, Massachusetts Ploughman, HUSBANDMAN, MICHIGAN FARMER, Coleman's Rural World, American Agriculturist, Dutchess Farmer, New England Homestead, COLORADO FARMER, Farmers' Review, Scientific American, GREEN'S FRUIT GROWER, Iowa Homestead, HOME FARM, FARMER AND FRUIT GROWER, AMERICAN RURAL HOME, PRAIRIE FARMER, Grange Visitor, SOUTH HAVEN MESSENGER, Vine Dresser and Industrialist.

The following list of persons have contributed to the pages of the Portfolio this year: C. G. Patton, Iowa; J. J. Thomas, Union Springs, N. Y.; Charles Downing, Newburg, N. Y.; G. W. Campbell, Delaware, Ohio; H. B. Elwanger, P. C. Reynolds, W. C. Barry, Patrick Barry, E. Colston Vick, Rochester, N. Y.; Dr. T. H. Hoskins, Vermont; J. M. Smith, Green Bay, Wis.; C. W. G., Grand Rapids, Mich.; Wm. Rowe, Arkansas; G. Cowing, Muncie, Ind.; W. W. Tracy, Detroit, Mich.; Charles E. Parnell, New York; Gen. W. H. Noble, New York; Aug. D. Mylius, Detroit; C. M. Hovey, H. C. Hovey, Boston, Mass.; Thos. Brown, Grand Rapids, Mich; W. H. White, P. E. Cope, New York; J. N. Stearns, Kalamazoo, Mich.; R. A. Waterbury; Parker Earle, Cobden, Ill.; S. B. Peck, Muskegon, Mich.; O. B. Galusha, Morris, Ill.; P. E. Bucke, Ottawa, Ontario; B. Gott, Arkona, Ontario; E. P. Roe, New York; P. M. Auger, Connecticut; W. J Fowler, Rochester, N. Y.; G. W. Bridgman, Berrien county, Mich.; W. G. Voorheis, Benzonia; Franklin Davis; Profs. Beal and Cook, Lansing, Mich.; Prof. C. E. Bessey, Iowa; T. T. Lyon, South Haven, Mich.; Prof. Goodale, Boston, Mass.; J. G. Ramsdell, Traverse City; M. Crawford, Ohio; N. Ohmer, Dayton, Ohio; L. B. Pierce, Summit county, Ohio; J. C. Plumb, Wisconsin; Prof. Comstock, Ithaca, N. Y.; B. D. Halsted, New York; Sylvester Johnson, Indiana; Prof. W. A. Stearns, Iowa; J. A. Lintner, New York; W. Z. Hutchinson, Genesee county, Mich.; Profs. Goessman, Maynard, and Penhallow, Massachusetts; A. M. Purdy, Palmyra, N. Y.; G. F. Needham, Washington, D. C.; Prof. Higley, Ann Arbor; J. M. Asher; E. L. Sturtevant, Geneva, N. Y.; J. J.

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* Those printed in Small Capitals have been sent me during the year free of expense by the publishers.

Harrison, Painesville, Ohio; E. A. Bronson; Dr. F. M. Hexamer, Philadelphia; J. S. Woodward, Lockport, N. Y.; Julius Harris, New York; W. D. Philbrick, Massachusetts; F. D. Curtis, New York; Wm. S. Little, Rochester, N. Y.; C. E. Hewes; Josiah Hoopes, Penn.; H. H. Hunnewell, Boston, Mass. Thomas Meehan, Philadelphia, Penn.; Wm. Falconer, Boston, Mass.; M. Milton, Mansfield, Ohio; Jno. A. Warder, Ohio; T. C. Dewey, Kansas; B. F. Johnson, Champaign, Ill.

For purposes of reference I present the following scheme of general topics in the order they will be reached in the following pages:

1. Scientific and Experimental.
2. Societies and Organizations.
3. The Nursery.
4. Insects and Remedies.
5. Birds and Bees.
6. Diseases.
7. Pomology.
    - *a.* General Orcharding.
    - *b.* Apples.
    - *c.* Pears.
    - *d.* Peaches.
    - *e.* Small Fruits.
    - *f.* Grapes.
    - *g.* } Cultivation, Pruning,
    - *h.* } Thinning and Mulching.
    - *i.* Fertilizers.
    - *j.* Preserving Fruits.
    - *k.* Storing and Marketing.
8. The Vegetable Garden.
9. Floriculture.
10. Forestry and Arboriculture.
11. Landscape Gardening.
12. The Inner Home.
13. Miscellaneous Essays.

Secretary.

SCIENTIFIC AND EXPERIMENTAL.

DARWINISM AND HORTICULTURE.

The London Garden thinks that horticulturists have the best of reasons for writing eulogies upon Darwin.

At first sight it might appear that the theory of "evolution" and the "origin of species" had but little relation to practical horticulture. But this would be to take a very narrow view of the scope and aim of the latter. Besides, the wonderful array of facts which Darwin has gleaned from the wide field of botany and horticulture is, in itself, the most valuable contribution to the advancement of the science and practice of Horticulture. Whatever advances our knowledge of vegetable life or enlarges our conceptions of its marvelous adaptations and forces, likewise increases our power over it. Hence Darwin's facts, apart from the theories they establish, and with which his name will be forever associated, are so much more accumulated force and power over nature placed within the reach of cultivators. Granting the truth of the theory of evolution, it follows as a matter of course that we have not yet reached the end of it. Hence the horticulturist must never rest and be thankful with present attainments. "Forgetting the things which are behind, reaching forward to those that are before," must ever be his motto; "From good to better, from better to yet better still, and on towards unattainable best," his watchword. Our material is plastic, not fixed. Forms, colors, statures, sizes, substances, qualities, products, all go to be altered, changed, enhanced, improved. This is our first, most valuable, and far-reaching lesson from Darwin's teaching, Well learned it will show that the best of us are only on the threshold and not on the top stone of our victories over nature. Plant life and its powers are a great deep in which each of us has been dropping his short line, with which we may have drawn a few prizes. It remained for Darwin to reveal to us how fathomless and wide was the great sea of life from which we have all been trying to filch our finished products.

With this expansion of our views of the nature of the plants we cultivate will come larger knowledge of new and more rapid ways and means of production.

DISTINGUISHING PEARS BY BLOSSOM.

Prof. W. J. Beal said before the American Pomological Society that he found upon examining carefully the flowers of above thirty varieties of pears that the stamens were generally twenty in number for each flower, and were of four different lengths; the longest in any one flower being about one-third longer than the shortest. The longest and oldest stamens form the outside row, and the shortest the inside row. The latter are attached a little farther down the calyx tube than any of the others. The two rows of intervening stamens are between the extremes in their length and places of attachment. The set of shortest stamens are placed opposite the lobes of the calyx. There were twenty-five each in two flowers examined. In one flower I counted twenty-seven. In several varieties it was not an uncommon thing to find twenty-one, or twenty-two, or twenty-three, or twenty-four stamens, in which cases no definite order could be made out in regard to their lengths or places of attachment, though they varied in these respects. In some varieties the filaments are short; in others, long; in some, stout; in others, slender.

The stamens of the Kirtland pear were the longest of any seen. The longest set of these were nine millimeters, or about three-eighths of an inch. The shortest stamens seen were those of White Doyenné. These were five millimeters, or about three and one-half sixteenths of an inch, or about five-ninths as long as those of the Kirtland. The anthers of different varieties vary somewhat in size. The styles of apples unite at the base, forming a stem or *stipe.* The styles and the stipes of flowers of different varieties of apples differ in length and diameter. Some are very densely covered with wool or hair; some are perfectly smooth. Between these, in different varieties, we find all intervening stages.

The styles of pear blossoms for a short distance at the base, perhaps one-sixth to one-tenth of their length, are firmly pressed together, but they readily separate. In most cases this portion of the styles is slightly hairy. In some cases it is perfectly smooth. The longest styles seen were those of Amire Joannet, and were a trifle over one decimeter, or six and one-half sixteenths of an inch in length. The shortest styles seen were those of Howell and White Doyenné and were over six millimeters, or about one-fourth of an inch in length. The shortest styles were about three-fifths the length of the longest.

The strongest points for describing and classifying apples by their flowers are, found in the styles and their stipes. In pears these are their weakest points.

The professor has progressed far enough in this investigation to become convinced that the flowers should be described in connection with a description of every variety.

BEES AND BLOSSOMS.

Prof. A. J. Cook argues that the bee takes nothing essential to the flower when it extracts its might of nectar, and the chances are that it may accomplish some good in the fertilizing of the blossom. The following is an abridgment of his article upon the subject:

There is not the slightest evidence that the taking of the nectar in any way injures the plant or diminishes the yield of fruit. On the other hand, it is fully demonstrated that in case of many plants no fruit can be secured unless some insect visits the flowers and thus carries the fructifying pollen from the distant or shut-up anther to the waiting stigma. And in case of those plants where the position of the parts of the flowers is such that self-fertilization is possible, it is found by repeated experiments that unless insects visit the plants the yield of fruit will be very much lessened. Darwin proved conclusively in case of squashes and other cucurbitaceous plants and our fruit trees, that to prevent bees' access to the flowers was to greatly injure the crop. Professor Beal has demonstrated the same truth in regard to red clover at our college. Years ago the same senseless, ignorant prejudice that now frowns upon Fostoria prevailed in New England. The bees were denounced and the demand made that they be banished. Now the fruit-growers and gardeners, wiser grown, encourage the presence of bees, and often keep large numbers purposely to effect the more perfect development of the seeds which it is their chief business to produce.

Of course some other nectar-loving insects may do this work as well as bees, but owing to their limited numbers, especially early in the spring, they alone are not sufficient, and unless there are bees the work will be poorly done in case of most plants, and, as formerly experienced about Boston, a consequent loss will follow. This truth is well illustrated in case of our red clover. Because of the long flower-tubes of that plant few insects other than bumble-bees can reach the nectar, and so the perfect fertilization of the ovules demands these bees in great numbers. But all the bumble-bees die off in winter except the queens, and so early in spring they are very rare, consequently the first crop of red clover, as all farmers know, bears very little seed. In August the bumble-bees are counted by thousands and the second crop of clover is abundantly fruitful. Alsike clover, on the other hand, which is supposed to be a hybrid between red and white, has shorter tubes and so is visited by all of our bees, and the first crop is very prolific of seed.

SUNLIGHT AND FRAGRANCE.

The Rural Canadian notes the fact that attention has recently been called to the marvelous fragrance of the flowers and fruits that grow in Siberia and the more northern portions of the various countries of Europe. The few fruits that grow there are also very highly flavored. The like is also true of the flowers and fruits of northern Michigan. The finest strawberries found on this continent are raised on the southern shore of Lake Superior. They are of very large size and have a very high flavor, and are so fragrant as to render them desirable for the aroma they throw off. Observation shows that continued sunlight produces aroma and high flavor the same as a high temperature produces the quality of sweetness. In a high latitude the days during summer are very long, and it is at this season that the flowers blossom and the fruits ripen. The addition of two or three hours of sunshine has a wonderful effect in producing flavor and fragrance. The quantity of essential oil that can be extracted from flowers grown in Sweden is much larger than can be obtained from the same kind of flowers raised in the south of Europe. Flowers raised in houses are less fragrant than those raised out of doors, as they get less light. It is believed in England that the electric light may be made useful not only in increasing the growth of plants, but in adding to the fragrance and flavor of fruits subjected to its influence. Experiments already made show that flowers grown in houses lighted by electricity during the night are much more fragrant than those which grow out of doors.

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President Lyon, in Rural New Yorker, devotes a column to this same subject. He thinks the notion that a tropical sun is required to develop color and flavor to the highest extent is rather poetical than true. California fruits grown in genial climate are wanting in both these valuable characters, while excelling in size; as we come eastward and northward, the color hightening nearly as the latitude increases, till we reach very nearly the northern limit of fruit culture, and especially of the cultivation of the larger fruits in the region of northern Michigan and Ontario, where, also, we are surprised to find the maximum of color.

The Centennial exhibition illustrated the fact that none of the exhibits there shown equaled in brilliant, rich colors the fruits of the British Provinces and of northern Michigan, Wisconsin, and even Minnesota.

The potency of the long-continued sunlight of the far north for the development of color was also very noticeable in the collections of apples from Montreal and from the Grand Traverse region of Northern Michigan, at the recent meeting of the American Pomological Society at Boston.

The facts above narrated seem to lead very naturally to the conclusion that abundant and long-continued light rather than great heat, is the dominant factor in the development of brilliant colors in fruits.

Flavor, on the other hand, while it can by no means be held to be independent of the influence of light, seems, in an increased degree, to demand the elaborating influences of warmth.

The summers of the North are often extremely warm; and experience has long since demonstrated that upon the transmission of a variety of fruit northward, there can be no doubt of its equal success in its new location, if only the season is of sufficient length to bring it to maturity before the development of flavor shall be checked by the chill of Autumn.

DOUBLE FLOWERS AND SEEDS.

In Vick's Monthly we find the following:

Perfectly double flowers cannot produce seed, since all the reproductive organs are converted into petals. Semi-double or partially double flowers may produce seed, and these flowers possibly may be self-fertilized or may be fertilized by others partially double or by single ones, and in either case may form seed, a considerable portion of which produce flowers more or less double. Or single flowers fertilized by semi-double ones may produce seeds capable of similar results. Unusually large and vigorous plants are not particularly favorable for the production of seeds, but rather particularly unfavorable; plants of medium vigor, neither stunted or forced into rank growth, are best. The raising of seeds that will produce double flowers is an art that requires much experience to enable one to practice it successfully, and nearly every kind of flower requires a peculiar and special treatment.

WHEAT IS A FRUIT.

The above question has been asked at a good many of our meetings, but often the querist has worn a dissatisfied air upon getting the information which the best authorities were able to give. The Gardener's Chronicle believes in sticking pretty closely to the botanical definition. It quotes Webster's first definition as follows:

"First is, whatever is produced for the enjoyment of man or animals by the processes of vegetable growth," and remarks that it is clear that branches, leaves, flowers, roots, tubers, seeds, perfumes, galls even, might be thus classed as fruit, even as the Irishmen call the noble tuber, "the fruit at the root." But for gardening purposes, and still more for botanical purposes, a little more precision is necessary, else we might as well say that mother and child are identical, and that the nail on the great toe of Hercules is equivalent to Hercules himself. The dictionary is, however, equal to the occasion. If we do not like one meaning, we can try another. Here is one that will suit our purpose—"That part of plants which contains the seed." The dictionary at once goes on to spoil that definition by extending it and making it so vague that it ceases to be a definition at all; but we will stop at the "part of plant which contains the seed"—we will confine it to that, and not include anything outside the fruit, not being an integral part of it; nor will we include anything inside of it which is not essentially a part of it. The fruit is that part of the plant which contains the seeds, and it is nothing else.

What oddities botanists are! They seem to reverse the natural order of things—they leave on their plates the fruit, and they eat something which they say is not the fruit. What is that something which they say is not the fruit? To answer this question to his own personal satisfaction—not, that is, to be depended on dogma and "I say so" evidence, which is a kind of evidence eschewed in science except where no other can be had—the reader should see before him a flower of an apple or pear in the earliest stages of its growth, and he should trace in other stages from this earliest condition to the ripe state, the growth of the apple or of the pear. There are not many young gardeners who have skill and patience enough to do this thoroughly.

What in ordinary language is called the fruit is the swollen flower-stalk. So, then, to say that the core of the apple is the true fruit, and the flesh thereof the dilated flower-stalk, is no dogma to be accepted as an article of faith, but is a statement which any one with a pair of eyes, ordinarily nimble fingers, and and a little patience, can at the proper season verify for himself. And to be able to recognize the core of an apple as the fruit proper, and to see in the flesh of an apple a swollen flower stalk, is not to indulge in a mere botanical technicality, as some might at first be inclined to suppose, but it affords a means of ascertaining a truth, and as such of opening up possibilities of future utility and development; for truth is never barren of results—the sterility lies with the man who does not avail himself of the truth so far as he can—deep thoughts to be devolved from the castaway core of an apple.

FRUIT AS FOOD.

A physician contributes to Neltnor's Fruit and Flower Grower, the following ideas:

It has been ascertained by careful analysis that apples contain a larger amount of phosphorus, or brain food, than any other fruit or vegetable, and as much nutrition for the system as potatoes. The acids they contain are needed to assist the system to rid itself of effete matter, which if retained, hinders the organs from performing their functions, causes inaction and many diseases.

The juices of the various berries aid the system to overcome the lassitude caused by warm weather, and should be eaten freely in their season. The importance of fruit as an article of diet does not receive the consideration which it deserves. If parents were to realize their value there would be money saved from doctors' bills, and many less empty cradles and mourning hearts.

If the mothers in the country were correctly educated in regard to the value of fruit, used as it comes to us, stored with delicious flavors, the result of nature's alchemy, she would not spend time laboring to form with it some health-destroying compound of grease and spices to tempt the appetite, but would go with her children into the orchard or berry field, inhaling the invigorating air and bathed in the magnetism of the sunshine, there would be no lack of appetite for dinner or supper, at which the golden or rosy-cheeked apples, or delicately-tinted berries are eaten freely, and the rest of neither mother nor child would be disturbed by pain or restlessness, caused by indigestion.

When the lunch for school is prepared, if it consisted only of good, nutritious bread and plenty of mellow apples, or luscious grapes, there would be no occasion for complaint from headache and inability to study, for the stomach would not be clogged by indigestible food, and the brain would be in a condition to be trained and strengthened. Owing to its composition, the brain is not liable to be overworked when the digestive organs are in good order, and of those said to be injured by overstudy in the schools, a majority have lived largely upon stimulating food and nick-nacks, to the exclusion of fruit.

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Upon the same point, the Western Farmer makes a practical point: It is said of a doctor who became largely interested in peach growing, that he recommended peaches to his patients on all occasions. The story was told to illustrate the man's meanness; but if he was mean it was a meanness that benefited his patients, If men were wise they would spend two days in a vineyard or orchard to every five minutes in a drug-store when anything is the matter with them. If you have dyspepsia, eat fruit. Did you ever think what a doctor gives for dyspepsia? He gives an acid. Fruit will furnish a better acid than the drug-store will. Do you know what the doctors dose you with when your liver is out of order? With acids. Then why not supply the remedy yourself from your own garden? Why continue to have your medicine done up in such a repulsive mixture when nature furnishes it in so palatable a shape.

DEAD BRANCHES DETRIMENTAL.

Prof. C. E. Bessey, in the New York Tribune, takes the ground that dead branches upon a tree are detrimental to its health and growth; arguing from the now acknowledged fact that the escape of water from the leaf does not differ in any way from the evaporation of water from any other moist surface, he says:

A leaf is a mass of cells, every one of which is gorged with watery matter, which in a dry atmosphere, as a matter of course, tends to escape. The epidermis, composed of dryish, impervious cells, which entirely surrounds the watery cells of the leaf, would prevent almost completely the evaporation of water from the latter were it not for the breathing pores before mentioned. These pores are for permitting the free ingress and egress of gases, particularly oxygen, carbonic acid, and probably, also, ammonia. Now, when the pores are open for their legitimate purpose it happens that more or less water escapes, if the air is dry. If the air happens to be very moist, the loss of water through the breathing pores is very little or even none at all.

We may put it in this way: The leaf loses water simply because it is a watery structure; its epidermis is designed to prevent this loss, and the breathing pores with their power of opening and closing are for the same purpose. A leaf instead of being an organ of evaporation is actually a structure in which evaporation is quite successfully checked. Careful experiments made under my supervision in the Iowa Agricultural College in 1880 by Miss Ida Twitchell, a graduate student, demonstrated that the evaporation from a moist piece of dead wood was exactly like that from a living leaf. Now when a dead branch is large enough to keep continually moist in the interior it will in dry air constantly lose water by evaporation from its surface. This water so lost is taken from the tree, and must have been supplied directly or indirectly by the living portions. Moreover, it must be remembered that a living branch is well protected against loss of water through evaporation, by the epidermis which covers all its surface when young, or the impervious corky bark which is always found on it when older. When a branch dies, these protecting devices soon fall into decay and the water, so carefully guarded by the living parts of the plant, is wasted by evaporation.

RELATION OF PLANTS TO WATER.

In connection with the above from Prof. Bessey, it may not be out of place to quote briefly from a lecture by Prof. Goodale before the Lowell Institute:

He said that aquatic plants absorb water through the surface of all submerged parts. Plants fixed in the soil absorb water through the superficial tissues of the youngest roots; and chiefly through root-hairs. Leaves of such plants absorb no moisture, even when wet by rain. When a plant is torn roughly from the soil, nearly all these root-hairs (which are delicate, elongated cells, thickly clothing a short portion of the youngest roots just behind the root tip) are left behind, and the power of the plant to absorb water is ended. The idea that the tip, or *spongiole*, absorbs water has been exploded by experiments, as also the idea that when these root-hairs, or the portions of the root which bear them, are torn off, water is absorbed by the wounded part. The whole work (except in the case of coniferous trees, which have no root-hairs, and absorb water by the newer parts of the root, but never by the tip) of forcing water into the plant, against a pressure of three to five atmospheres, is done by these minute and delicate root-hairs. The manner in which this work is done was then described, as far as possible, as follows: If two liquids of different density are placed in contact, they will become mixed in a short time, by the process called diffusion. If a vegetable or animal membrane is interposed between the two, the diffusion is not impeded but hastened, and this hastened operation is called "diffusion by impulse," or (from the Greek) *osmosis*. This operation is what takes place in plants, although the fact that endosmosis alone exists in them, without exosmosis, for a time caused botanists to seek for another solution of the problem.

The process of root absorption and the transfer of the dilute solution is hastened by transpiration, or evaporation from all parts of the plant that are exposed to the air. The amount of daily evaporation from common plants has been approximately determined by careful experiments, which show that grasses and similar plants in a hot summer day exhale about their own weight of water. A sunflower three and a half feet high was found to present thirty-nine square feet of evaporating surface, and its roots had the aggregate length of 1,448 feet. The process of transpiration is regulated by delicately balanced double valves, called *stomata*, of which there are 100,000 in a single apple leaf, and which are so sensitive as to close if the leaf is shaken. These valves consist of pairs of cells controlling the opening of minute tubes leading to the inner cells through the outer membrane of the leaves, which is impervious to ordinary transpiration.

Transpiration affects the plants themselves, the air and the soil. In the plant it hastens the transfer of the juices, and condenses the solutions in the transpiring cells. The air is both cooled and moistened by it. The soil is relieved of superfluous moisture in some cases, as for instance by the gum tree planted in the Roman Campagna to drain the swampy soil and thereby diminish malaria. It is not probable that plants affect the amount of rain fall in any great degree, but they do act as storers of moisture. This they do partly by shading the ground and checking direct evaporation, and partly by allowing smaller plants to grow in their shade, and by the action of their roots keep the soil in a condition to retain moisture. Moreover the rain is prevented from running off the surface as soon as it falls, as it will do from a surface not clothed with vegetation. In districts which have been made treeless by human instrumentality, periods of parching drouth are followed by devastating torrents. Men who recklessly destroy forests may well say, not "after us the deluges," but "after us drouth or deluge."

"HARDY" IN HORTICULTURE.

The Rural New Yorker says that hardy is a relative term and often when used means absolutely nothing, for many plants and trees that do perfectly well in Wisconsin may not prove "hardy" in Ohio. Or again, plants that may succeed for years in one place may by some train of circumstances be injured or killed outright. So that hardiness does not vary with the parallels—that is plants do not necessarily grow less hardy as they are taken northward or *vice versa*. Winter killing, the Rural thinks, is not concomitant with want of hardiness. Whenever a plant, from unsuitable soil or situation, is restricted in its season of growth, the plant must in some way suffer. But as the damage is not apparent until it has passed through the trying seasons of winter and spring, the remote causes thereof are lost sight of, while the severity of winter is alone held accountable.

WHO SHALL EXPERIMENT.

Judge Ramsdell, who is alive to the interests of agriculture, urges that Michigan should have an experimental station in the hands of the people; that is, that the people should feel free to go to it for information. Now, in lines of experiment that the individual cannot afford to follow out the farmer has only his college to look to, and it is not the business of this college to perform experiments. Its work is to teach young people to become successful in industrial pursuits, and it is impossible to crowd into the work of the professors these lines of experiment that would require their entire time and thought to successfully prosecute. The judge argues that our State cannot afford to be without a station which is carried on in the direct interests of our agriculture. We are glad to reach the next generation of agriculturists by educating boys for farmers, but we want some immediate results, some direct answers to difficult questions that experts can answer. Such a station should be in connection with the college, but should have a special work to do. It would relieve the college of labor that it can now only attempt, not perform, and at the same time be a valuable auxiliary to the instruction there.

C. W. G.

ORGANIZED AGRICULTURE IN MICHIGAN

REORGANIZATION OF THE BOARD OF AGRICULTURE.

At the time this Portfolio is being compiled, a scheme for reorganizing the Board of Agriculture seems likely to be presented to the present Legislature for action; and it is desirable, certainly, that some law be enacted which shall unite the various departments of agricultural work in our State. We have all sorts of societies that have been created in the interests of agriculture in the State, still there is little harmony of action between them. There is no head that all of them recognize.

The Agricultural College is educating young men for industrial pursuits, trying some experiments, and holding some institutes--doing a valuable work under the direction of a board of agriculture. The title of this board is a misnomer. It has nothing to do with Michigan agriculture save indirectly; it has simply charge of this college.

There is connected with the office of Secretary of State a department of farm statistics, which issues bulletins monthly and an annual report. Many valuable things grow out of this institution, but how inappropriately is it connected with the Department of State. It is only accidental when the head of this department is a farmer, or has any interest in agriculture. Why should he have charge of a bureau arranged for the benefit of Michigan agriculture?

We have a State Agricultural Society that has been identified with our industrial interests for several decades, and has done a very valuable work, but it is engineered by a set of men who work independently of any other institution. Until within a very few years it was directly antagonistic to the Agricultural College, and has no connection whatever with the bureau of statistics.

Again, there is the State Horticultural Society, which has been for twelve years actively engaged in developing a special interest in our State, that has grown to be a power for good simply through the influence of a few public-spirited individuals, and the cordial sympathy of the State Agricultural Society.

All these working institutions should bear such a relationship to each other that their methods and objects should be in harmony. They might strengthen each other, and together be a power for the uplifting of the industrial interests of Michigan that we have not yet realized.

Jealousies have been engendered because these different organizations did not understand each other, and they have actually, through antagonism, rendered nugatory, some of the best measures attempted for good purposes.

Now is a good time to get these organizations together. The present Legislature can do no better work. Michigan should have a head to its agricultural interests. If a law could be enacted, making the Board of Agriculture a board of control over not only the Agricultural College, but over an experimental station, the bureau of statistics, and a department for the dissemination of information among the people,—and the various organizations should each have a part in naming the men upon this board,—all would feel glad to recognize a head that would be able to dictate harmonious measures in them all. The farmers and fruit-growers of Michigan need help in their occupation and should not waste any of their energies in antagonizing each other through rival organizations.

LIBERALITY IN A GOOD CAUSE.

At the last meeting in the year of the New York Horticultural Society the wealthy men of New York subscribed $110,000 for the purchase of a permanent building in which to hold meetings and have exhibitions.

While waiting for the committee to make their report, the President took occasion to state that the whole amount of the purchase money for the new building had been raised, and now very much if not all of our anticipated success would depend on our exhibitions. We ought to make them as pleasant and interesting as possible to the public, they were so prompt in responding to the call for funds. On looking over our old charter he had observed that the same class of people had responded to-day as had received our original charter. For instance, here are some names recorded in the act of incorporation of 1822, with whom he had a personal acquaintance: Martin Hoffman, Kinloch Stuart, Thomas Ludlow, Peter Schermerhorn, Maturin Livingston, David Hosack, James Lenox, Gardner Howland, all very familiar names a half century ago; now, all passed away. Of the names recorded in the act but one remains to-day—Walter Langdon, who lives to see the society which he assisted to create in 1822, in its own home at the age of sixty. Seventeen gentlemen had subscribed $5,000 each and eighteen from $1,000 to $2,000 each, and thus the building had been secured to the Horticultural Society. Our success depends now on the interest the working members will take. We must not be behind Boston or Philadelphia. He hoped improvement would soon be made in the building, and considered it a subject for congratulation that we had secured so fine a building in so desirable a locality, and that so little change was necessary to make it ready for our use.

LOCAL HORTICULTURAL SOCIETIES.

President Ohmer, of the Montgomery (Ohio) Horticultural Society, says that no societies (unless it be church organizations) do as much good in the community as our horticultural societies. That fact is recognized even by those who do not attend our meetings.

Mathew Crawford, of another Ohio society, remarks that there is a pleasure in becoming acquainted with those who are interested in the same things that interest us; and one of the advantages of a society like this is, that it brings people together and makes such acquaintance. One day in a month is not too much to give to a work so enjoyable and at the same time so profitable. The American people have but few holidays, and none of us will accomplish less during the year on account of time spent at these meetings. Those who are well posted can do good, and all can get good. Horticulture is a very comprehensive subject, and no one can excel in all its branches. Nearly every one has his specialty, and he knows some things about it that others do not. The landscape gardener is not always a skillful fruit grower, nor is the botanist necessarily an entomologist. Essayists familiar with the subjects assigned will prepare papers which will start discussions, and in this way valuable information will be elicited. These papers and discussions will be printed, and will carry to hundreds and thousands a knowledge of the different branches of horticulture. The effect of all this will be seen in the improved surroundings of all who come within the influence of our society.

L. B. Pierce, in the Ohio Farmer, puts much truth in little space in the remark that to the silent, leavening influences of its literature, a society adds the magnetic force of its hearty, spirited monthly meetings, and infuses the spirit of horticulture into whole neighborhoods where perhaps it previously existed in one family only. Horticulture constitutes the poetry, the painting, and the music of terraculture. It not only has charms for the farmer, the fruit grower and the gardener, but for the merchant and the professional man as well. To every one who has a home it brings in some way joy, amusement, and instruction. Upon its high plane, in some of its branches, the rich and the poor can meet upon terms of equality and mutual sympathy. To advance, then, those pursuits and pleasures of earth culture which cluster around every home, should be the object of a true horticultural society.

Mr. J. C. Plumb, in Western Farmer, wishes young people could be made more interested in these societies. The old adage is "Old men for counsel and young men for war," which is well enough, provided the young men take in their counsel.

We were reminded of this need, when as a visitor we met in convention so large a number of horticulturists of Illinois, and saw so few of their young men there (and ladies too, except at election hour). G. W. Mineer, in an able report called attention to the same fact, and urged that the life of our societies depended upon enlisting the young. Friend Osborne, of Iowa, on the same subject, says "The young men are not engaging in fruit culture much," and at the National Agricultural Convention at Chicago we saw next to none of the young farmers.

Now, should it be so? We don't want our venerable friends to absent themselves, but we do want to see "young blood" in council with mature wisdom, and would urge the fathers to provide for the attendance, and those who prepare programmes to see that some young people are enlisted, and the social element have a place in every meeting, in ways best adapted to the locality.

FLORAL HALLS AT FAIRS.

E. Colston Vick, who made a beautiful display at our last State fair, contributes a valuable article to the Ohio Farmer concerning halls for exhibition, from which we extract briefly as follows:

A dark, small, building, where the exhibitors are always crowded, only discourages the exhibiting of flowers, plants, etc. I have seen good, cheap halls made of plain board sides, about inch stuff I should judge, being well braced, and the top simply covered with ordinary hot-bed sash, or sash very much resembling it, which makes a very neat, light building. One great pleasure derived from the cultivation of flowers is the evident delight they afford our friends, and the amateur or even the true professional florist is almost as proud of his choice flowers as the mother of her children. Then there is great satisfaction in knowing that your flowers are exerting an influence for good on all who behold them, some of whom are sure to become imitators and successful cultivators. It is for this reason that I desire to see larger exhibits of flowers and plants at the State and county fairs, so that these exhibitions may be productive of good. One fine floral exhibition will do more for taste and morals than a million horse races.

To arrange cheaply for a floral display he says: Make a common rough board table about three and a half feet wide and as long as necessary to accommodate all exhibitors. In front of this table nail a board four inches wide, and at the back a board five inches in width, projecting upward, and a similar board at each end. The space thus formed fill with moist sand and make it smooth on top. The exhibitors place their flowers in this sand and it keeps them as fresh as in water. The taller flowers or bouquets can be placed at the back part of the table where the sand is deepest. For a dividing line between different collections, take a piece of red tape or evergreen wreath. To keep the crowd from pressing upon the table and injuring the flowers, place a guard around and about eighteen inches from the table. This space furnishes a place for the committees and for exhibitors, where they can stand and answer any questions the people may ask, or give any information they may desire. If it is desired to make the exhibition somewhat elegant in appearance, the sand may be covered with moss and the table and guard ornamented with evergreens or with wreaths.

WHAT OTHERS SAY OF US.

Mr. B. Gott, a delegate to our last annual meeting from the Ontario Fruit Growers' Association, makes a few points in his report of the meeting that we will insert here, even if it does flavor of "approbativeness:"

The various topics brought up for discussion were introduced by the reading of a well written paper on the subject by a person previously notified and announced. The discussions were full and free and most friendly and agreeable in tone. Indeed, I may say that the prevailing sentiment of the members in all their discussions was one of extreme tenderness and candor. The presence of numerous ladies of apparently high standing in society added much to its interest. The deep interest they seemed to take in all the proceedings was somewhat surprising, and was kept up to the end. This was a very encouraging feature of the meeting. In one case we were much pleased to notice a good industrious lady who, notwithstanding her pressing home duties, was evidently more than a match for the difficulty, by bringing her knitting with her; and while her nimble fingers were faithfully plying the bright needles, her attentive ear and watchful eye as carefully followed the theme under discussion. Oh, Hood! had you lived in this our day, how much would you have modified the tone of your famous "Song of the Shirt." The final session on the evening of the third day was very brilliant, being one of the finest things I ever saw at a fruit meeting. I considered it was the fullest exponent of the question "How to make horticultural gatherings interesting to the public." One of Steck's grand concert pianos was brought on the dais, and through the instrumentality of cultured fingers was made to do most excellent service. The meeting was publicly announced to be open to all, and the citizens came in great numbers and nearly filled the great hall to repletion. The programme for the evening was short speeches on popular topics, of not more than five minutes' duration, given by members of the society and distinguished guests who were present, interspersed by choice selected renderings by the singers. The programme was carried out in the happiest manner, and apparently to the highest enjoyment of the audience. Secretary Garfield, who is well known to be one of those ever-ready and highly favored mortals who is always equal to the emergency, and has always just the right thing to say in the right time and place, was the very life and soul of the meeting, and a very large contributor to its grand success. Altogether these interesting sessions of the State Horticultural Society's meeting in Flint are long to be remembered and something that we shall look back to with recollections of pleasure, on account of their friendly associations and their instructive discussions.

THE LESSONS

We feel to have learned and may safely carry away are:

"1st. How to get the popular interest and coöperation at horticultural meetings? By constant effort in educating and elevating the people; by soliciting their attention and coöperation in a work in which they are so much interested; by making them feel that by promoting the general good they are at the same time securing their highest individual good, and by offering them benefits and giving them something they can carry away with them.

"2nd. How to get out a large and fine fruit display? By requesting contributions of each and all the fruits in their season, and by offering premiums and distinctions to those who make an effort to increase the interest of the meeting. Displays of fruits at a meeting like this are closely inspected, and are the very best means of educating the people who inspect them.

"3rd. How to maintain the interest and attendance to the end? By having a varied and well digested programme of popular and interesting subjects to offer; by getting out the fullest and freest discussions upon them in an interesting and friendly way, and by having something instructive and new every day."

THE NURSERY.

PLANT THE BEST SEEDS.

Col. Marshall P. Wilder, upon being asked to give ten lines of his best thoughts for a live newspaper, took the following text from one of his own addresses: "Plant the most perfect and mature seed of our very best fruits, and as the means of more rapid progress, cross-fertilize our finest kinds for still greater excellence," and furnished the following lines:

Plant the best seeds of every good fruit,
Good fruits to raise, all lands to suit,
Fruits which shall live, their blessings to shed
On millions of souls when we shall be dead.

These are creations that do the world good,
Treasures and pleasures with health in our food,
Pleasures which leave in the memory no sting,
No grief in the soul; no stain on Time's wing.

For fruitage and flowers let praises arise
From earth's utmost bound to heaven's highest skies.
Songs of rejoicing where'er they are found,
Songs of thanksgiving where'er they abound.

CAN GRAFTING CHANGE VARIETIES.

Upon this often discussed question our keen observer, Mr. H. E. Bidwell of Plymouth, remarks in the Country Gentleman:

In the nursery, where we take pieces of seedling apple roots and graft cions of different varieties of apples on them, the roots in one year partake of the characteristics of the variety grafted in. A variety having a straight, upright top sends down a few correspondingly straight roots. A variety with a thick spreading top makes numerous spreading roots. An observing nurseryman can therefore distinguish some varieties by the roots. Most apple trees are grown in this way and by it tend to retain their characteristics, even the peculiar markings of the shoots. The Golden Russet, for example, always has its smooth, yellowish bark dotted with white spots on the limbs and trunk, and the pencil markings of the grain of the inner bark extend from the leaves to the ends of the roots, accepting from the soil certain food required for that variety of leaf, flower, and fruit.

Where buds are put into two-years-old seedling apple trees, the seedlings being variable, it requires several years to change the roots to make the nursery trees of a variety similar, and the time required to change with a weak growing graft is greater than with a strong grower, the trunk and roots still performing their office for the original variety. The graft receiving the sap furnished by the roots, some elements are in excess and some deficient for the requirements of the leaf of the new variety. A great difference in the characteristics of two varieties will produce a perceptible difference in effect on the growth of that graft, on the size and color of the leaf and fruit. I have a great many varieties of apple trees top-grafted to Red Canada, that most difficult variety to establish, and I can see a perceptible difference in some of the fruit. Six Lady apple trees, limb-grafted to Red Canada, produce smaller, greener, and better keeping apples than a tree of Black Detroit grafted to Red Canada, which bears apples twice the size, darker colored, and poorer keepers. A scalloped variety of apples in my orchard gives its scallops to the apples of Red Canada grafted on it, all the apples on the five trees having similar scollops. They have borne the past four years and still retain the scollops. I have grafted these scolloped Red Canada apples on other trees to establish the variation.

Prof. Beal writes to me on this as follows: "I have in my cellar two lots of Red Canadas, one grown on top of a Spy tree and one on Early Harvest. Apples from the latter rot first and are less brilliant in color. I believe what you say of the effect of graft and stock. It is now well established that the stock and graft more or less affect each other."

PROPAGATION BY CUTTINGS.

In his address before the American nurserymen Mr. J. Jenkins, of Winona, Ohio, gives a number of very practical suggestions, from which we cull as follows:

Most varieties of grape-vines, currants, gooseberries, roses, and much of the shrubbery supplied by nurserymen, grow readily, and are grown from out-door cuttings. Whether of trees or vines, in-door or out-door propagation, the operation of nature in the growth of the cutting is the same. The bud holds within its brown envelope the principle of life, which extends through the cells that have carried the circulation, extended the growth, and established the bud. After the cutting is divided, nature's first effort is to form a callus with the descending cells that would have gone to extend and enlarge the roots on the mother vine.

If instead of abruptly dividing the cane or shoot to be used as a cutting, a system of ringing or strangulation be followed, every bud may be made to produce a plant. This strangulation or ringing is performed on soft or green wood by tying thread tightly around the point where the cutting is to be separated, and on hard wood by a ring of copper wire drawn closely. This will cause an enlargement and a deposition of cambium at the point of arrest, and make the growth of the cutting thus prepared, when finally separated and planted, almost as certain as though they already had roots.

One very successful experiment with out-door cuttings of the grape was performed by allowing the canes to remain on the mother vines until the buds had started a growth of one-half inch or more and the leaves had begun to unfold, every eye was separated, the old wood placed entirely below the soil, the new growth just appearing above the ground, shaded carefully, with a result of full eighty per cent of vine.

In the usual manner of preparing cuttings greater success follows when the cuttings are taken off immediately on the fall of the leaf before freezing, when they should immediately be packed away in moss or soil until time for planting in spring.

Cuttings of currants and gooseberries taken in August and September may be immediately planted, covered with a heavy mulch of straw to carry them through the winter.

Grape cuttings from out-door planting may be made with single eyes, but all the advantages of a two-bud cutting may be retained by simply cutting across the node with a sharp knife or with shears, commencing the cut opposite and one-eighth of an inch or more below the bud and finishing one-eighth of an inch or more above.

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Upon the subject of rose cuttings the Rural Canadian says that European horticulturists have lately adopted a way of making them root with more certainty, by bending the shoot, and inserting both ends into the ground, leaving a single bud uncovered at the middle and on the surface of the ground. The cuttings are about ten inches long, and are bent over a stick laid flat on the ground, holes being dug on each side of the stick for the reception of the ends of the shoot. The roots form only at the lower end of the shoot, but the other end being buried, prevents evaporation and drying up. A correspondent of the London Garden states that he has tried this along with the old mode, and that while the weaker cuttings of the latter have shown symptoms of drying and failure, all the former have grown vigorously.

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Following up the same topic further we gather from the Michigan Farmer that water alone, if still and pure, will serve as a bed in which to secure the rooting of green cuttings from growing shoots. A single cutting, or two or three, may be set in a bottle of water as soon as taken off, and held in place at the neck, by a bit of cotton to support the cutting, so that its base may be in the water, and the top, with its two or three small leaves, exposed to the air. As it will not be safe to disturb the cutting by changing the water, it is a good plan to put a few small bits of charcoal into the bottle. A simpler method still is to put an inch or two of sand into the saucer, and fill to the same height with water. The sand serves to hold the cuttings upright in the saucer, and quite a number can be set in one saucer. No covering will be needed in ordinarily genial June or September weather, and the cuttings will not flag in mild sunshine if they are from sun-loving plants. As soon as rooted they must be changed and tenderly planted in good, mellow, sifted soil.

PROPAGATING BY SPROUTS.

"Quis Quis," in the New York Tribune, says that our fruit books teach misleading doctrine when they unconditionally prefer seedling stocks to sprouts. When we use seedlings we run the risk of what the constitutional vigor or hardiness of each individual seedling may be; usually more than half will prove to be naturally weak. When one of these seedlings has attained age enough to show its power of making growth—of throwing out roots freely, forming firm, healthy leaves, and ripening stout wood completely, a sprout from such a stock is far preferable to the average of seedlings, and beyond comparison with the weakest among them. There are sorts of grapes, currants, willows, shrubs, etc., which have been grown solely from sprouts or cuttings for centuries without any diminution of vigor. The only care needed in this simple means of propagation is that roots be freely thrown out in every direction to properly brace and support the future tree. This end is usually secured by shortening the roots found on the sprout, which induces a multiplied emission in all directions. A second transplanting aids much in this establishment of abundant roots.

GRAFTS CUT BELOW ZERO.

John J. Thomas questions if the doctrine about the worthlessness of grafts cut in severe weather be true. He thinks it would be a curious inquiry to ascertain where this opinion originated, for it has evidently been copied by many without examination. We never could discover any other harm from pruning trees in cold weather than what results from pruning before the arrival of the cold, and that is simply making them more tender and liable to injury by the cutting or wounds. And the only harm which could happen to grafts cut under a low temperature, is sudden thawing by taking them into a hot room instead of packing in damp moss. The past winter, when the thermometer was several degrees below zero, pruning was performed on both fruit and hardy evergreen trees, and no apparent harm whatever has been the result.

ANTS AS INSECTICIDES.

A writer in the Boston Journal of Chemistry says he watched with great interest last summer the work of a colony of black ants which attacked canker worms on an elm tree in his grounds and was very much gratified at the results. "Two processions of the ants," he says, "were moving on the trunk of the tree, going up empty, the other coming down, each ant bringing with him a canker worm, which he held fast in his mandibles, grasping the worm firmly in the center of the body. Although the prey was nearly the size of the destroyer, the plucky little ant would run down the tree in a lively way, deposit its booty in its nest in the ground and instantly return for further slaughter. There were at one time as many as forty coming down the tree, each bringing along his victim, and doing the work with apparent ease." Extending his observations, he noticed that the ants ran up the trunk and out on the limbs and from thence on to the leaves of the trees, where the filthy worm was at work, and seizing him with a strong grip at about the center of the body, turned about with the squirming worm and retraced their steps. The worm was dead by the time the ant reached the ground. If this work of the ants is common they must prove valuable friends to farmers and fruit raisers, and should be protected in every way possible.

CABBAGE BUTTERFLY.

Mr. Charles R. Dodge, while at sea recently, eighty miles off the coast of Delaware, was surprised to observe a cabbage butterfly (Pieris rapæ)—and he thinks a female—fluttering in the air just forward of the pilot-house. The hold was open and it may have come from some of the vegetable crates stowed on the main deck, but, whether it did or not, in these days of fast steam vessels between our country and Europe, the incident illustrates how readily noxious species may be imported, even with the utmost care to the contrary.

STRIPED BEETLE AND SQUASH BUG.

A correspondent of the New York Tribune says that for the little striped beetle which comes in early summer there is nothing better than very dilute Paris green or London purple, one part of the poison to twenty of flour, or one tablespoonful of the poison to three or four gallons of water, and even then put on with great caution. Very little will kill the beetles, while the plants will not stand very much more. He has no trouble to save his vines, squash, melon, and cucumber, by use of these substances. He has, by intrusting the making of the application to other hands, lost all of the vines treated. The grayish black squash-bug is more difficult to manage. Gathering the eggs and the old bugs early in the spring is laborious but sure if thoroughly done. The bugs will crawl under pieces of boards laid among the vines, and may be gathered and caught. The use of such poisons as above recommended for the striped beetle will do no good in case of the bugs, as they do not eat the leaves, but pass their beaks through the outside of the leaf to suck the juices, and so will not get any of the poison.

The Rural New Yorker gives the following remedy for squash bugs:

To make one barrel of the preparation, use half a bushel of fresh hen manure. Put this into the barrel and fill up with water, leaving room to stir and mix thoroughly. When I put the seeds in the ground I prepare the mixture. The older it is the better. Stir every three or four days, and keep covered to prevent evaporation. When the vines are large enough, apply the liquid with a coarse sprinkler. Stir the contents of the barrel thoroughly each time you apply it, and keep the barrel filled up with water. Bear in mind that this is a powerful fertilizer, and be careful not to use too much at a time. I usually apply it two or three times a week, or as often as the bugs make it necessary. It is also a sure remedy for cut worms.

ALUM AN INSECTICIDE.

C. W. H. in Fruit Recorder says he dissolves one pound of alum in three gallons of water and has used the solution successfully in fighting the cabbage worm. He says:

I tried the alum solution on my currant bushes and recommended it to others, and in every instance it had the desired effect. For washing down the trunks of young peach, pear, and apple trees it works nicely, and I would recommend its use as a cheap, effectual, and non-poisonous insecticide, always ready and always reliable for me. Its action on the worm or caterpillar is instantaneous, and he seldom needs more than a few doses.

VINE-HOPPERS.

Harris, in his "Injurious Insects," says of the vine-hoppers:

The vine-hoppers, as they may be called, inhabit the foreign and native grape vines, on the under surface of the leaves of which they may be found during a greater part of the summer; for they pass through all their changes on the vines. During most of the time, the young remain perfectly quiet, with their beaks thrust into the leaves, from which they derive their nourishment by suction. As they increase in size they have occasion frequently to change their skins, and great numbers of their empty, cast skins will be found throughout the summer adhering to the under sides of the leaves and upon the ground beneath the vines. When arrived at maturity, which generally occurs during the month of August, they are still more agile than before, making use of their delicate wings as well as their legs in their motions from place to place, and when the leaves are agitated they leap and fly from them in swarms, but soon alight and begin again their destructive operations. The infested leaves at length become yellow, sickly, and dry, and give to the vine at midsummer the aspect it naturally assumes on the approach of winter. But this is not the only injury arising from the exhausting punctures of the vine-hoppers. In consequence of the interruption of the important functions of the leaves, the plant itself languishes, the stem does not increase in size, very little new wood is formed, or, in the language of the gardeners, the canes do not ripen well, the fruit is stunted and mildews, and if the evil be allowed to go unchecked, in a few years the vines become exhausted, barren, and worthless. In the autumn the vine hoppers desert the vines and retire for shelter during the coming winter beneath fallen leaves and among the decayed tufts and roots of grass, where they remain till the following spring, when they emerge from their winter quarters, and in due time deposit their eggs upon the leaves of the vine and then perish.

Prof. Comstock in commenting upon this description in the New York Tribune says:

Since Harris wrote this admirable account comparatively little has been added to our knowledge of these insects. The only practicable remedy which has been proposed is to collect the dead leaves late in the autumn after the insects have become dormant and burn them, thus destroying the insects which are hibernating among them. I have the testimony of a prominent vine-grower of California that he has practiced this with success. Although the autumn is the best time, those vine growers who wish to try this remedy can still do so during the coming spring. Care must be taken to act promptly as soon as the snow is off and before the leaf-hoppers have left their winter quarters. Pyrethrum dusted over the vines at the rate of one pound to the acre is said to have given excellent results. But the supply of this valuable insecticide is as yet limited. As these insects are attracted to light, trap lanterns and torches have been suggested as a means of destroying them. But I have but little confidence in their being used thoroughly enough to accomplish the desired end.

PEACH BORERS.

Among the many remedies given for the destruction and prevention of the ravages of the peach grub, we find that of Sylvester Johnson, President of the Indiana State Horticultural Society, who says: "I keep my trees in healthy condition by destroying and preventing the grub. This is easily done by removing a small portion of the earth from the body near the roots and filling its place with a pint to a quart of soft soap, from the middle to the last of May. If the grub has previously found his way into the tree, the soap will kill him; if he is not there, he will not get in after the soap is placed there. This method has never failed with me."

THE GREEN CORN WORM.

Dr. Byron D. Halsted, in the American Gardener discourses upon the corn worm that has recently made its appearance in Michigan, and about which we have received very many inquiries:

It is the same insect that has done so much damage to the cotton crop in the Southern States, where it is known as the boll worm. The caterpillar is generally of a pale green color, marked with black longitudinal lines, with several scattered dark spots from which hairs arise. When full grown the "worm" is about an inch and a half in length. It does not seem to be at all particular as to its diet, eating with voracity tomatoes and even young pumpkins, but it does its most destructive work in the cotton and corn fields.

The female moth deposits her eggs upon the corn silk and the young caterpillars soon work their way down under the husks to the tender, sweet kernels and there riot in fine living. In some fields nearly every ear of corn will be infested with from one to three worms, and upon stripping down the husks, one or more rows of corn, as shells, mark the path of the destroyer. Sometimes the husks are perforated on the side, whether for ventilation or entrance or exit is not well known.

When the caterpillar has attained its full size it descends into the earth and spins a silken cocoon. In about three weeks the moth or perfect insect comes out. It is generally thought by entomologists that the insect passes the winter in the moth state, probably finding a hiding-place and shelter among rubbish, etc. From the habits of this pest it can be seen that any remedy used must be directed toward the destruction of the mature insect or moth. Nothing can be put on the ear of corn that will kill the worm that would not endanger the corn for table use. In fact, the presence of a worm is not known until so much mischief is done as to render the ear worthless.

The doctor calls attention to the method of destroying the moth by lights and fires in the night, but admits that in so doing many beneficial insects will also be destroyed, and questions how far this process may be practicable.

PYRETHRUM POWDER.

The editor of the Rural New Yorker has been continuing his experiments with pyrethrum, and reports as the results for this year that several kinds of caterpillars found on pine and apple trees are destroyed by it, if blown upon them through a bellows. This is a most economical way of distributing it, since a very small quantity may be made to go a long way. A gill, for instance, would suffice for an infested tree ten feet high. If the air is quiet one can force a spray of powder through the bellows to a distance of six feet easily enough, while the powder will prove more effectual than if the insect received it nearer the nozzle of the bellows.

The smallest quantity blown into the forming heads of cabbages will kill the destructive cabbage worm in from twelve to eighteen hours. The lightest puffs blown in their tents will kill the tent caterpillar in about twelve hours. At first they do not mind it in the least; then they begin to worry, and in five minutes are in a state of agony or at least of great excitement. In ten minutes they begin to drop to the ground, where in a few hours they will be found dead and dying.

The price of fresh, pure pyrethrum powder is very high, but used through bellows, a small quantity may be made to do such effective service that the saving of time renders its use economical. Speed the day that we may grow our own plants and manufacture our own Dalmatian insecticide!

PROTECTION FROM INSECT ATTACK.

J. A. Lintner, before the Western New York Horticultural Society, read an elaborate article on the above topic.

He stated that economic writers upon entomology make a distinction between preventive and remedial measures.

While the preventives that have been proposed are comparatively few, the remedies could be enumerated by hundreds. Merely to specify a few, we have the popular applications of Paris green, London purple, hellebore, and pyrethrum, in powder or in liquid form; carbolic acid, kerosene and other oils; soft soap and other alkaline washes, lime, ashes, soot, dust, salt, hot water, hand picking, tree-jarring, burning infested twigs, attracting to fires, to lights, or to adhesive sweets—all tending to the destruction of insect life in one or more of its several stages.

It will readily be conceded that the use of preventives, whenever practicable, is more economical, more effective, and often more convenient than a resort to remedies. An old familiar adage affirms this truth, when it asserts that "An ounce of prevention is better than a pound of cure."

He assumed that the deposit of insect eggs could be prevented, giving examples of the use of various odorous substances successfully in accomplishing this end, and said that the question of how the substances employed prevented the egg deposit was a very important one because upon its answer depended valuable generalization concerning methods of dealing with insect life. He believed insects were guided in the deposit of their eggs by the sense of smell. The marvelous compound eyes of most species had misled people to think that sight was their keenest sense.

While sharing in this belief I had often wondered at the incomprehensible acuteness shown by an insect in the discovery of the particular species of plant upon which alone the young caterpillars proceeding from its eggs could feed, —in the discovery of a single individual of a rare species occurring in a certain locality, and growing in such a manner as effectually to hide it from human observation. When its range of food-plants extends beyond a species to all the members of a genus, how could it detect all of the often greatly differing forms? When a still broader range embraces the several genera of an extended order, a still greater variety of forms are presented, which the rude insect brain must group and classify and claim within its province. How amazing such knowledge without previous instruction. It had no parents living, as in the class of vertebrates, which might teach it by example. It had no ancestors a whit wiser than itself from which to learn. The deposit of the egg in its proper place may have been but the second voluntary act of its imago life, regarding that of flight for the purpose as the first. Perhaps a plant from some distant shore, of which not one of its ever so remote ancestry could have had any knowledge, is brought within its range of wing; its flight is unhesitatingly directed to it, and its precious burden of eggs, without a shadow of mistrust, is at once committed to its leaves. Such knowledge has never been attained by our most distinguished botanists, and it is beyond the scope of human intellect. We have called its displays instinct—a word conveniently framed to cover manifestations in other classes of animated beings, which we are utterly unable to explain. As a partial explanation of these wonders it has been suggested that to the insect world may have been given senses differing in number and in kind from those which we possess. But all the wonderful phenomena attendant upon insect oviposition by selection, is readily explained under the supposition that it is guided and controlled by the sense of smell.

The essayist gave striking examples of the extraordinary development of the sense of smell in certain animals and in man under peculiar conditions, and asks the question if his theory is not a reasonable one. He then gave the various notions of prominent scientific men as to the location of this sense in insects.

ECONOMIC ORNITHOLOGY.

Prof. Stearns, of the Massachusetts Agricultural College, addressed the Connecticut Board of Agriculture upon the above topic, taking the ground that a majority of our birds were of value in repressing insect life. He said it was still a question how to place birds in the two classes, beneficial or injurious; individual species lap over so upon each other in their habits. The hawks are acknowledged birds of prey; they catch our chickens; so, also, do crows, which have not been called predacious. The robin is another about which there is much dispute. It certainly eats fruit; it destroys a great many insects when they are more abundant than fruit, which is the greater part of the time. The young robin is insect-eating, and requires more than the weight of its body daily when growing in the nest. The swallows are sometimes annoying on account of the filth left about their nests, but they destroy vast numbers of insects, particularly those which infest grain fields; 500,000 insects is not more than would be required to keep the inmates of a single nest fed during the three weeks of growth. The bluebird collects his insect food near the buildings and on the lawns. The kingbird should be cherished; if he can be induced to build in a cherry-tree no robin or other bird will be allowed to take the fruit. The blue jay helps man by scattering and planting the seeds of fruit trees. The chickadee must be classed as a friend to the farmer, though he is somewhat destructive to other birds by destroying their eggs. Of the eighteen species of birds of prey which inhabit our grounds, thirteen remain with us the whole year.

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A writer in the Country Gentleman takes a different view: Cultivators do not make sufficient discriminations between useful and noxious birds, and useful and noxious insects. There is no reason to believe that destructive insects are kept in check more by insect parasites which prey upon them, than by all the services performed by birds; and the insect-eating birds are as likely to devour these parasites, which are the friend of the cultivator, as noxious species.

We have had tens of thousands of curculios killed in our orchards by a single active hired man, and at the rate, while he was at work at them, of two thousand a day, but it has been rare to find one of these beetles in the crop of any bird. Had we waited for the birds to do the work, our trees would not have borne the loads of yellow, and crimson, and purple fruit which we have enjoyed. The codling-moth has for many past years nearly ruined our apples, notwithstanding the flocks of birds frequenting the orchards; the work of one man last spring, for less than one day, gave us fair apples on the loaded trees with not one infested specimen in half a dozen. The same man destroys tens of thousands of potato bugs with less labor than he cultivates the crop, but no bird except the larger domestic fowls will touch them. The orchard caterpillar is always destroyed by hand, the birds making no impression.

Of the clouds of insects which appear in summer, a large portion do neither harm nor good, and on these the insectivorous birds chiefly subsist. The question of the utility of birds has very little connection with fruit-growing. The matter of their encouragement rests with our interest in them on other grounds. There are a few species which live on the small fruits of summer, and sometimes sweep off in a few hours the careful labor of years; and these fruits the cultivator will be willing to allow them as a matter of choice, if he happens to prefer bird to fruit. Others will feel disposed to protect their fruit in the same way that they protect themselves against other noxious animals, such as moles, mosquitoes, etc.

KILL THE SPARROWS.

H. E. Bidwell, of Plymouth, in this State, took boards that had been placed near barrels in which apples were stored, and upon which many larvæ of the codling moth had congregated, carried them out and spread them on the ground to have the birds and hens destroy them. He recounts what followed in these terms:

I was greatly mortified to see the sparrows run over the cocoons in search of wheat screenings thrown out to call them down. My sorrow was soon turned to joy to behold a pair of blue birds come down as it were out of heaven, and alight on the nearest bird house, doubtless occupied by them last season, but which had been appropriated by the sparrows this winter. No sooner had they alighted than their bright eyes discovered the cocoons on the boards, and they darted down to secure the prize.

Disgusted with the sparrows, I took a step ladder and commenced to clean out the sparrow's nest in the blue bird's house. I found in the strings that composed their nest two curculios, three snapping bugs, one bee miller, one old female codling moth, and two recently hatched moths. Examining the strings, I found webbings of worms and burnt edges of cloth, and ascertained that they had pulled the strings out of an old smudge left near a bee hive under an apple tree. This led me to examine the boards placed for the bee stands. (The bee hives had been removed to the cellar in the fall.) On the boards exposed to the sparrows all winter were numerous cocoons. One pair of our own blessed little insectivorous birds is worth more to the fruit grower than all the imported sparrows.

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A correspondent of the New York Times takes the same view of the sparrows, closing a lengthy communication in substance as follows:

Legislatures have passed laws protecting these pests, and farmers should insist upon having these laws abolished. Sparrows are not insect-eating birds. They devour the buds of trees in winter, and in summer devour fruit, grain and seeds. They are, therefore, out of the list of useful birds. They are, however, very good eating. They are always plump and fat, and are as good game as the reed birds. They are sold in the English and French markets, and are accounted a delicacy when entombed under the crust of a pie. It would be no pity to turn them to this use here, and as farmers are undoubtedly justified in saving their crops from the despoilers, they can not only do this but secure an agreeable variation from the frequent pork and bacon by shooting and trapping them, and having them served up in pies, or roasted in the oven.

BEES AND HORTICULTURE.

The following paper was read by W. Z. Hutchinson at the annual meeting of our society in Flint, December, 1882:

It is a well-known fact that sex is not confined to the animal kingdom alone, but extends to the vegetable kingdom as well. The sexual organs of plants and vegetables are located in their blossoms. The majority of plants produce perfect blossoms; that is, blossoms having both stamens and pistils. But we sometimes find blossoms having only stamens, or male organs, others having only pistils, or female organs; and these male and female blossoms may be borne on the same plant or on different plants. Some varieties of strawberries are called pistillates, because their blossoms have only pistils. These strawberries will not bear fruit unless planted near those varieties whose blossoms have stamens.

The squash or pumpkin vine bears both kinds of blossoms on the same stalk. soon after a squash vine has put forth runners, the blossom buds begin to appear at the junction of the leaf-stalks with the vine. As the buds develop the stems develop also, until they are a little longer than the leaf-stalks. The blossoms now open, and we have large yellow flowers. At the center of each flower is a yellow cylinder, about an inch in length, covered with fine yellow pollen. These are the male flowers, and from their structure can never produce squashes; their office is wholly to supply pollen to fertilize the pistillate blossoms. The first pistillate blossom rarely appears nearer the root than the seventeenth leaf. Instead of having a long stem to support it, this flower opens close down to the junction of the leaf-stalk with the vine. It has a small globular formation beneath it, which is the embryo of the future squash. If the structure of the blossom is examined, it will be found to differ from the tall, male flower, in having the central cylinder divided at the top into several parts. These are what botanists call the pistils, and it is necessary that the fine yellow dust of the male flower should touch them, to fertilize them, that seed may be produced and a squash grown. This may be proved by so confining a blossom that no pollen can gain access to it, when the blossom will wilt, and the embryo squash turn yellow and decay.

When the conditions are most favorable, the flower sends out a fragrance which attracts the bees. Prof. Gray calls this perfume the flowers' advertisement. The bees instinctively read therein that they are welcome to all the exuding nectar they can bear away, if they will carry the pollen on their legs and bodies to the pistils. It has been suggested that honey is placed in the flower to attract the bees. After a bee has found honey in one flower it will be very likely to examine others of a similar appearance. In the spring, when the blossoms first open, many of the bees, very likely the young bees who have never before seen a flower, will be seen examining the leaves, branches, and even rough wood of the trunk of a tree, until they find just where the coveted treasure is located. After a bee has dived deep into one blossom and tasted the nectar, he knows where to look next time. It is plainly to be seen that flowers were not given their bright colors simply that we might feast our eyes upon their beauty.

Nature, who is a most careful economist, not only deals out honey in small doses, but she places it in the most cunning nooks and corners, that the bee may be obliged to twist himself into all possible shapes, around and among the stamens, until the pollen is most surely dusted all over its body and legs. Within the flowers of the barberry there is a contrivance by which on the touch of the proboscis of the bee the stamens spring forward suddenly and shower the insect plentifully with pollen with which it may fertilize some other barberry blossom. The flower secretes no honey until the pollen is ripe and ready to do its work; then the honey slowly exudes into the nectaries, so that the bees may be kept coming and licking it out, in every hour of the day, and the flow of honey ceases just as soon as the pollen is ripened and gone. Mr. A. I. Root says: "The Catawba is a very desirable variety of grape, as is also the Deleware; but the former is very late, and the latter very small. Dr. Grant originated the Iona, by fertilizing the blossoms of one with the pollen of the other; but, in his first attempt, he failed repeatedly, because the bees were sure to upset all his experiments by their intermeddling. When he thought of covering the flowers from which he wished to produce the hybrid seed, with lace or something of a similar nature to keep the bees away, he succeeded at once; and we now have the Iona as the result, a grape that is just about half way between the Delaware and Catawba, having very distinctly the flavor of each."

It has very frequently been urged that bees injure fruit and grain by taking honey from the blossoms; and I believe the matter was carried so far in a town in Massachusetts, that an ordinance was passed obliging a bee-keeper to remove his bees to another locality. After a year or two had passed, the fruit growers decided that they would rather have the bees brought back, because so little fruit set on the trees, in proportion to the number of blossoms that appeared. As it was a fruit growing district, it was a matter of considerable importance, and the bees were brought back. Of course, with the bees came fruit in abundance, for many kinds of fruit absolutely depend upon the agency of bees to fertilize the flowers, thus enabling them to produce fruit. It has been stated that unless we have a few hours of sunshine when early cherries are in bloom, we shall have no cherries at all; and we occasionally have a season when cold rain storms so prevent the bees from getting out that not a cherry is produced.

While the honey bee is regarded by the best informed horticulturists as a friend, a strong prejudice has been excited against it by many fruit growers, and, in some communities, a man who keeps bees is considered as bad a neighbor as one who allows his poultry to despoil the gardens of others. Even the warmest friends of the bee may be heard lamenting its propensity to banquet on their beautiful peaches and pears, and choicest grapes and plums. But it should be remembered that the jaws of the bee, being adapted chiefly to the manipulation of wax, are too feeble to enable it to readily puncture the skins of even the most delicate grapes. If it were otherwise, whole crops of fruit would be destroyed by bees whenever a period of protracted drouth cut off their supplies of honey. Wasps and hornets, which secrete no wax, being furnished with strong, saw-like jaws, for cutting the woody fibre with which they build their combs, can easily penetrate the skin of the toughest fruits. After the mischief has been begun by other insects, or wherever a crack or a spot of decay is seen, the honey bee hastens to help itself. In this way they undoubtedly do some mischief; but before war is declared against them, let every fruit grower inquire if, on the whole, they are not more useful than injurious. If the horticulturists who regard the bee as an enemy, could exterminate the race, they would act with as little wisdom as those who attempt to banish from their inhospitable premises every insectivorous bird, which helps itself to a small part of the abundance it has aided in preserving.

BLACK KNOT.

Dr. Byron D. Halsted says in the American Garden that black knot is now known to be of fungus origin, and therefore is related to the peach curl, potato rot, wheat rust, and a long list of other microscopic plants too small to be seen except by their destructive effects as they prey upon the higher forms of vegetation. The fungus or parasitic plant was first described in 1838, but it remained for Dr. Farlow of Harvard university, to publish a full account of the minute plant and its methods of propagation and growth. Quoting from Dr. Farlow he gives this argument against the theory that the disease is caused by insects:

First the knots do not resemble the galls made by any known insects. Secondly, although insects, or remains of insects are generally found in old knots, in most cases no insects at all are found in them when young. Thirdly, the insects that have been found by entomologists in the knots are not all of one species, but of several different species, which are also found on trees that are never affected by the knot. On the other hand, we never have the black knot without the *Sphæria morbosa* (the scientific name of the fungus), and the mycelium of that fungus is found in the slightly swollen stem long before anything that could be called a knot has made its appearance on the branch, and furthermore is not known to occur anywhere except in connection with the knots.

He gives the the following facts concerning the disease and its remedy:

The knots range in size from an inch to a foot in length, usually growing upon one side of the branch, causing it to bend away from that side, or twist irregularly. The parasite first makes its appearance in the spring, when the affected branch increases rapidly in size and becomes soft in texture. The bark is soon ruptured in various places and the soft interior comes to the surface, expands rapidly, and soon turns green. Multitudes of minute spores are formed on this exposed green surface, which fall away and are carried by the winds, etc., to other twigs, thus propagating the disease. These spores continue to be formed until late autumn, when the surface of the knot takes on a dry and black surface. In the meantime insects may have taken possession of the soft tissue within and so eaten and destroyed it that at the end of the season only a thick, hard crust, or shell, remains. Another kind of spore is found in small pits and sacks of the crust, and as they form late in autumn they are the winter spores of the fungus and the form in which the pest is carried through the winter. These spores germinate in the spring and thus continue the black knot. The same knot lasts for several years, or until the branch is killed, it spreading from the old growth up and down the branch.

The only remedy is the knife. A branch once affected is beyond recovery, and as long as it remains is a seat of propagation of the spores of the fungus. The knots should be cut off some inches below the main part, because the wood for some distance is filled with the threads of the fungus. I have seen cases where the knot was thought to be entirely removed by the knife and a new one would form at the cut end of the stump, thus showing that the work was not properly done. The removed branches should all be burned, as the knots contain spores which will otherwise become detached and spread the disease. The best time to cut the knots is in late autumn, because the leaves having fallen the excrescences can be more easily seen.

RASPBERRY RUST.

A correspondent of the Fruit Recorder says that the first visible indications of rust upon raspberries are a slender growth of the young canes, and in plants more than a year old an unusual number of slender canes, and invariably in connection an apparently yellowish red rust on the under side of the leaves, particularly on the border of the leaf. The disease seems to be both hereditary and contagious, tips from diseased plants showing the disease before they are a foot high; while plants vigorous and healthy and bearing fine crops of fruit will sometimes become entirely worthless the following season. Sometimes only one side appears to be affected, and I have in many cases removed that part of the bush, but invariably the rest soon follows: I believe a prompt and thorough removal of all diseased plants a safe and efficient remedy for the disease.

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P. M. Augur, State Pomologist in Connecticut, remarks upon this fungus and others of its ilk, as follows:

When the blighted leaves of the raspberry plant or vineyard have fallen, they should all be raked off and burned to destroy the breeding spores, thus aiding in checking the disease in future. An application in May of ten bushels per acre of air-slaked lime will tend greatly to prevent mildew on the grape or rust on the strawberry, raspberry, or blackberry. In the vineyard let the above be followed with a dusting of sulphur about July 1, from the sulphur bellows, to be repeated at intervals of two or three weeks, somewhat according to the damp, sultry weather which may prevail. When culture, pruning, and thinning have been good, the owner may with great profit use these well-known antidotes of all the destructive fungi with many varieties of grapes; this will be an essential condition to prevent failure and loss.

THE YELLOWS.

We have been picking up all the things said and written concerning the peach yellows during 1882, and although enough has been written to fill volumes, really no new facts have been brought out. However, we give space to some opinions as follows:

A correspondent of the New York Tribune, who listened to some learned papers at the Montreal meeting of the association devoted to progressive agriculture, says:

Prof. C. E. Goessman reported in reference to peach yellows that the disease at the Massachusetts Agricultural College was far worse in trees on poor, light soil; where the soil was strong it obtained little hold. He thinks—and Professors Penhollow and Halsted agree—that the fungi seen in the cells is a result of the disease, not a cause. It seems evident from the surroundings that there is some lack in the soil which gave rise to the enfeebled growth. Professor Maynard in 1878 commenced to treat the soil where the diseased trees were to a superphosphate, adding three or four pounds of chloride of potassium to each tree. Soon the trees improved and now they are in good health. Professor Penhollow and the writer both made chemical analyses of the sound and diseased wood. There was a lack of potash in the latter and an excess of starch in the cells. The cause of the disease seems to be improper assimilation, because of impoverished or improper soil.

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From the Boston Journal of Chemistry we quote:

Noticing in the annual report of the Massachusetts Agricultural College the remark made by Prof. Maynard, of the botanical department, that the peach-trees on the farm which had been attacked by the yellows were now in apparently good condition, and free from the disease, we wrote to him asking if he would give some further information upon the subject. As the remark implied that a "cure" had in some way been effected, it was very desirable to know how it had been accomplished. Prof. Maynard replies as follows:

We have a number of peach trees that have shown every indication of disease, and which are to-day as healthy as any trees on the place.

In our experience we find that trees are not attacked by this disease unless the soil becomes poor or the trees are weakened by overbearing. The top generally dies while the root remains alive for one season after the top appears dead. Our treatment has been, when a tree begins to show signs of weakness or disease, to cut back severely—not only the shoot but the main branches—then apply an abundance of plant food, and especially potash; but I think potash alone will not cure the disease. I believe if a few healthy cells can be produced the tree can be renewed in perfect health.

The manure we have used has been muriate of potash, from three to four pounds to each tree, well distributed around the tree, ground bone or superphosphate, and some organic matter if the soil is very poor. We have used in some instances, with good results, Navassa phosphates, containing a large per cent of iron, also manure from the blacksmiths' shops, which contains much iron.

We do not claim to have discovered a positive remedy for the disease called the yellows, nor to have proved what the disease is, but we believe that by proper treatment the peach tree may be kept in a healthy condition for a long series of years, and produce an abundance of fruit when the buds are so matured as to withstand the cold.

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A peach grower at St. Joseph reports a case in which a peach tree affected with the yellows was dug up and dragged out of the orchard, brushing against nine other trees during removal, and says that the following year the nine trees were infected with the disease; upon the announcement of which fact A. M. Purdy is lead to remark, "Ah! how's that, ye scientific and philosophical professors, 'soil and poor cultivation' is the cause, eh? We again repeat that soil and cultivation has nothing to do with it."

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G. F. Needham, of Washington, D. C., says this disease is the yellow fury of the peach tree. It has destroyed and is destroying more orchards than all other causes combined. The cause is not known. The only remedy is to dig up the trees and burn them at once, and prevent the contagion from spreading. If it be desirable to replace the tree, the soil should be removed, and fresh earth that has been well limed should be used in its place.

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At Lawton, in this State, are gathered a few fruit growers who understand their business. They would like to know what the cause of the yellows is, and if there is a remedy would apply it vigorously. But in the absence of this exact knowledge they propose to do the next best thing, and do it well. These men are organized into a horticultural society and had the present yellows enactment printed and posted conspicuously in prominent places, with the statement that the Lawton Horticultural Society would prosecute all violators of law which were brought to its notice. Along with this announcement was a similar one concerning trespassers. The result of this action was that there was less pilfering of fruit and greater alacrity in removing diseased trees than ever before.

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W. K. Higley of the Michigan University, who has been devoting the past two years to a scientific examination of the dread peach yellows, concludes that the nature of the disease is fungoid, and claims to have found mycelia in the trunk, branches, and in the fruit of affected trees, but none in the roots. He says the disease cannot spread by insects in the pollen, but may be scattered by the wind, as it carries the spores to a great distance. It may also be conveyed in the buds or by the juice on the pruning knife. The only remedy he suggests is to cut and burn the diseased trees as soon as the malady makes its appearance, and to exercise caution in procuring buds, and to use care in pruning not to inoculate healthy trees by taking the knife used previously on diseased trees, until it has been freed from the fungus germs by dipping in carbolic acid or some other fungicide. He takes a hopeful view, however. If each one takes this care and is also careful to keep the orchard up to the standard cultivation, this malady which is troubling our orchardists to such an extent at present will surely fall and become a thing of the past. He is quite positive, considering the fact that man is not so liable to contagious diseases if in perfect health and well nourished, that if the orchard is kept in the proper state of cultivation it will not be as apt to contract this disease.

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The Prairie Farmer takes its turn at the subject:

If the theory is well founded that the leaves elaborate juice for the growth of the fruit, the leaves being deprived of proper nourishment the fruit cannot mature. It has long been observed that trees affected with the yellows fruit earlier and mature prematurely and soon decay. The presence of a larger amount of sap in the unhealthy than in the healthy tree indicates an earlier and greater flow than in that of the healthy tree. The presence of watery sap in the leaves, twigs, and buds would induce naturally an early growth of fruit and premature decay. From these and other observations the disease seems traceable to the body of the tree or roots. Applications of washes in this case to the leaves would probably prove useless, but if it should be applied to the bark and roots might possibly prove curative, and for that purpose, judging from microscopic observations, the frequent application of hot lye as the best substance is recommended.

J. M. Asher, National City, Cal., writes so long ago as 1872 that the soil of California is more or less impregnated with alkali, and he had never seen a case of yellows in the State. Whether a specific for this disease will soon be found remains in doubt. In its attacks it seems to be epidemic, ravaging a district of country for years, sometimes to such a degree as to destroy a majority of the orchards, those of negligent cultivators suffering first and most. It then declines, as it has done from time to time in the peach raising district of the Atlantic coast, again and again to reappear.

The best remedies are good fertilization and cultivation, setting no stocks but those perfectly sound, using no knife on healthy trees that has been used on affected ones until thoroughly disinfected with carbolic acid, and promptly grubbing all trees at the first knowledge of their infection.

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The Country Gentleman, in answer to a correspondent's question, says:

The yellows is a distinct disease, conveyed from one tree to another, by pollen from the flowers, by contact of the roots, and by pruning a healthy tree with a knife used on a diseased one. It sometimes spreads more rapidly and generally over an orchard in other unknown ways, and we have known it to attack trees miles away from any affected with the disease. In any reported observations, it is important to know this disease distinctly, as mistakes are sometimes made by supposing other maladies to be the yellows. The first clear indication is the premature ripening of the fruit, with purple discolorations of the flesh, and deficient flavor. These are followed, usually the next year, by numerous wiry shoots near the center of the head, a general sickly and yellow appearance, and death. No remedy has been found or generally adopted, but quite recently some experiments have been made that point to a copious application of potash or some of its compounds, as promising a prevention if not a positive cure—muriate of potash having been used for this purpose. The theory assigned is that the vessels of the affected tree are surcharged with starch, which the potash dissolves and dissipates; but further experiments are required.

The same journal remarks at another time an article which has appeared in some of our exchanges, credited to the American Naturalist, repeating the opinion that a thin and poor soil contributes mainly to the prevalence of the yellows in peach trees. This is doubtless true in some instances, but, as in other cases, and with other theories of tree diseases, facts frequently come in and seriously interfere. We have seen many trees affected and destroyed by the yellows within the past half century, some on poor soil and many on strong and rich soil, and one of the worst cases of this disease which we have seen was in a beautiful thirty-acre peach orchard, the soil of which was naturally strong and rich, and was highly cultivated. We shall have to modify some of our theories.

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At the meeting of the Western New York Horticultural Society, it seems a short session was devoted to the yellows. Dr. E. L. Sturtevant spoke briefly on the diseases of vegetable substances, and said that a free use of muriate of potash had been found an efficient remedy for the yellows in the peach; others had tried it with success. Potash was the needed substance, and the muriate was used because it was a cheap commercial compound. It must be applied in excess of the demands as plant food, the precise amount not yet determined, probably not over three or four pounds to the tree. Mr. Harrison, of Ohio, said that fresh wood ashes had been used successfully for the yellows. E. A. Bronson, of Geneva, mentioned instances where fresh lime heavily applied had prevented yellows and restored diseased trees. Two or three bushels were applied for each tree, and the lime was spread broadcast over the whole ground. Every tree thus treated was strong and healthy. President Barry thought that feebleness of growth was sometimes mistaken for yellows, and that more credit might have been given to remedies than they deserved. Dr. Hexamer mentioned cases of success in treatment of yellows, where the soil was drawn away and hot soap applied, the soap containing the potash required. Dr. Sturtevant explained the nature of the action of the potash. In the yellows, the vessels become overgorged with starch, and the circulation retarded or stopped; the potash dissolved it and set it free. This remedy had been worked out by scientific reasoning, and was not the result of random experiment. Trees which have been pronounced by distinguished authority as affected with the yellows had been cured by this remedy, but continued experiment is needed. J. S. Woodward said that the injury by the peach grub had been sometimes mistaken for yellows, and he pointed out the distinction. He was willing to take all the grubs if others would take the yellows from his trees. He had tried ashes, lime, bone-dust, and other remedies, but they did not stop or cure yellows—possibly because a sufficient quantity had not been used.

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H. E. Bidwell, an old orchardist and a careful observer, has his say as follows: I was yellows commissioner at South Haven, and had a favorable opportunity to watch its growth and development. Bacteria are found in budded and inoculated trees three years before the tree dies with the yellows, and in budded trees two years before you can discover any outward appearance of its existence. By taking buds from affected trees which may not then show the disease, and budding into healthy seedlings, and budding afterwards from the budded trees, the nurseryman can propagate the disease for years and not know of its presence. My theory is that while the young trees are in vigor, the bacteria are multiplying by feeding on the sap, and are carried by the circulating fluids to all parts of the tree, and in time are multiplied sufficiently to choke up the circulation and destroy the life of the tree.

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We can not give credit for the following, but give it place because it varies from the other opinions: Post mortem examination may locate the presence of bacteria, but this proves nothing in regard to the cause of the yellows—no more than would be proved by maggots in a dead carcass as to the cause of the death of the animal to which it belonged. We believe that the yellows in peach trees is caused by attacks of frost on unripened shoots. It is a common sight to find a peach orchard with leaves green and luxuriant one day, and next day to find them destroyed by a severe frost during the intervening night. This sudden check to growth is, we think, the cause of the disease, and renders possible the presence of fungoid growths and bacteria on the roots. When peach trees are cultivated in orchard houses, or under glass, where the leaves undergo the natural process of changing color, and gradually dropping off as the shoots become matured, no case of "yellows" has ever been noted, and this is good evidence that imperfectly ripened wood, when subjected to killing frosts, has a tendency to induce this peculiar disease.

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A correspondent of the Practical Farmer speaks out promptly and shuts his lips together as though he expected no farther controversy: We are asked if we ever knew the disease to be cured. We have, and now give the formula that cured several trees in Newcastle county, for which we can vouch, from our own observation. One ton peat made soluble by caustic soda, one-half ton sulphite of lime (gas lime), 200 lbs. caustic potash, 40 gallons coal-refiner's residuum (mixed with the caustic potash as soon as the barrel is opened, else the residuum becomes hard, when it takes a long time to dissolve it), 200 lbs. bone meal, 500 lbs. animal charcoal, the black residuum of the Ferrocyanide of potassium manufacturers. These crude materials carefully mixed together moistened, and left to heat, and then turned carefully, mixing in to hold the escaping ammonia, 500 pounds of land plaster will make a fertilizer that has cured many trees affected with the yellows, and caused large crops of fruit from trees regarded as worthless. A peck of the material should be worked in the soil around the tree in the early spring and a month afterwards a peck more. Two years' treatment may be required to fully establish the health of the tree, though the improvement will be marked in three months. The disease is caused by a lack of phosphoric acid, and of the peculiar peach element —prussic acid, supplied in an assimilable form by this preparation.

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We close the quotations upon this subject with the following:

At the late meeting of the New York Horticultural Society, during the discussion about peaches and peach trees, Mr. Julius Harris, of Ridgeway, said he did not suppose, three years ago, that there were any yellows in Western New York. He invested pretty largely in a peach orchard, and found those best cultivated least afflicted. Had made up his mind that it is a disease that commences in the roots. Knew a sweeping wind, in the fall, to blow over a number of peach trees; they were set up again, and when they bore the next year, every one had the yellows. Has twenty-five acres in peaches, and has lost but few from yellows; thinks he had three trees affected last year, and rooted them out; thinks it passes from tree to tree. The first diseased tree he had allowed to stand two years, when he dug it up and planted another in its place, and it has stood there two years and is free from yellows.

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Were it not for the fact that our Michigan peach growers that have had most to do with this fell disease are in no mood to laugh, they certainly would audibly smile at the above array of "notions concerning the yellows." It is a great pity that men that know most about the disease do not say more, and those who have tried one or two experiments would wait before making their conclusions public property. What we want is some scientific man to go into a country like Berrien county in our State, where the disease, in spite of the employment of the best knowledge concerning its prevention, has cleared out the peach interest; then let him dig until he feels that he has something accurate and valuable to communicate, and until that time to hold his peace. Until some one in whom the public have confidence will do this, we shall have no satisfactory solution of the problem.

FARMERS AND FRUIT GROWING.

W. J. Fowler read an excellent essay on the above topic before the Western New York Farmers' Club. We draw upon it as follows:

The idea among old-fashioned farmers that gardening and fruit growing, except of apples, is slow, "puttering" work, which can not be attempted without neglect of staple farm crops, is not wholly without foundation. Unused, as many farmers are, to the details of these little operations, it requires more time and labor for them to grow vegetables than it does to the practical gardener, and to grow small fruits than it does to him who makes that a specialty. A great many things have to be done at just such a time or not at all. Neglect of these often makes the garden vegetables of the gardener cost more than they would if purchased at the market. As for fruits, the great bulk of apples comes from the orchards of farmers; but it must be confessed that the profits in orcharding usually belong to those who make the care of their orchards their principal business. With the increase of insect enemies, the most easily grown fruits can not be produced without greater care than most farmers will give. If farmers attempt to grow even apples, they must pay the cost, or their crops will be of little value.

But there is a difficulty in growing fruit exclusively that is not often thought of. Orchards need fertilizers, and unless a due proportion of farm stock is kept, the requisite manure can not well be procured. While trees are growing, the manure question is held in abeyance. Thorough tillage will on ordinarily fertile soil insure a rapid growth of trees. When it comes to fruiting the case is greatly altered. The extra drain on the soil to produce the fruit requires additional manure, while the beating and washing rains make the soil too compact and heavy, showing that more vegetable matter is needed. So the man who aims to make fruit a specialty finds himself compelled to become a farmer as well, at least so far as keeping stock and making manure is concerned. If he thoroughly understands fruit growing it will probably give him a larger profit than ordinary farming. With this advantage he can, near large cities, buy stable manure, or he can afford to buy western corn and other foods, and thus increase the home-made supply of manure.

It will thus be seen that as the growers of fruit need to become farmers to insure the best success, it should follow that farmers who understand how to grow fruits, ought to have an important advantage in the business. As a rule the farm will keep its owner on fewer acres than he cultivates, and if he sets aside a portion of his land for fruit growing, the income from this will be net gain. But it is only farmers who have practical knowledge of the details of the fruit growing business who can safely attempt this, and when they do so it must be with the understanding that when the orchard and farm crops conflict, the orchard must take the precedence.

A PERFECT APPLE TREE.

H. C. Hovey, in the Scientific American, gives an account of a perfect apple tree, which we reproduce here to induce the reader to look about him and ascertain how near this ideal he can find a specimen.

The perfect apple tree, of which an account is here given, is a specimen of the hearty, juicy, old-fashioned Vandeveer Pippin. It was selected with care by my father in 1838, and transplanted to a sunny, sheltered spot, near his home in Crawfordsville, Ind. The virgin forest had just been removed from the fertile soil, amid which its roots were placed; and throughout its career it has been plentifully watered by the overflow from two ample roofs.

The law of spiral growth, so often distorted, has been beautifully wrought out in this individual tree. The reader is probably aware that the leaves on every tree follow a definite arrangement on the stem. The plan is highly complex in pines and and cedars, but simple in the apple tree. Fasten a thread to a leaf and pass it from one to another, in the same direction, and it will go twice around the stem before reaching a leaf situated exactly above the first. The divergence of the second leaf from the first is 144°, or two-fifths of a circle; there is the same distance between the second and third, and so on to the sixth, which is directly above the first. This is what is known as the generating spiral.

The leaf is the builder of the tree. It hangs out its inch or two of oval green in the air for breath and sunshine, and drinks in the dew and the rain, conveying the result of its vegetable chemistry to a permanent place in the substance of the tree. From the heart of each leaf a cord goes into the fiber of the wood which is only a binding and knitting together of many leaf-cords, and when the leaves shrivel and fall, these cords remain as their monuments. As Ruskin has said: "Behold, how fair, how far prolonged in arch and aisle, the avenues of the valleys, the fringes of the hills, the joy of man, the com fort of all living creatures, the glory of the earth, they are but the monuments of those poor leaves that flit faintly past us to die."

It is evident that, unless the only procedure of nature be in some way disturbed, each twig, branch, and bough, and the very structure of the trunk itself, should conform to this law of spiral development, the entire fabric being reared after the plan marked out by the first five leaves.

And thus it is, in the fine old tree here held up as an example of what a tree is capable of becoming. All its conditions have favored a symmetrical and uninterrupted development. Hence one can trace the spirals from the ground to the outmost bough, except where they lose themselves by being knotted together.

Five buttressed roots, each one foot in diameter, mark the emergence of the tree from the ground. The circumference of the trunk immediately above them is nine feet; and it is made of five distinct strands, like those of a rope, twisted around each other, until at the height of six feet from the ground and exactly over each corresponding root, each strand puts forth a branch. The girth of the tree, midway, is eight feet; just below the whorl of branches it increases again. The branches, five in number and arranged in a spiral, measure at the point of divergence respectively, three feet, three feet and six inches, three feet and eight inches, four feet, and four feet six inches. The height of the entire tree is about forty feet. The diameter of its canopy from north to south is forty-three feet, and from east to west it is forty-five feet.

It should be added that this patriarchal apple tree enjoys a green and fruitful old age; being still a prolific bearer, although it has stood where it now is for forty-four years, and is probably as much as forty-six years old.

RUSSIAN APPLES.

Some people have nearly gone crazy over Russian apples, and tree agents have sold anything and everything to meet the demand. The ardor of a good many has lowered as they have come actually to have experience with these varieties even when true to name. C. G. Patton in the Iowa Homestead, who has had a large experience, contributes to that paper his views, from which we abstract as follows:

Eight years ago I received from Washington sixty varieties of the government importation of Russian apples, which list I added to the next year and the year after. Four years ago I bought cions of apple, pear, plum, and cherry of Dr. Regel of St. Petersburg, Russia, that cost me thirty dollars. What I had two years ago from the college farm of these Russian fruits and those I had as before stated and from other sources in Vermont and Wisconsin would number nearly two hundred sorts. By hard winters, grafting upon unsuitable stocks, and the labor and care incident upon testing so many varieties, I have lost quite a number of them. And no one who has never tried it has any adequate idea of the cost of experimenting with so many varieties. Had I received fifty cents for every tree of these Russians that I have grown, it would not pay me in a pecuniary way for the thought and labor and money bestowed. And I shall do myself no injustice if I say that I have tried those fruits faithfully and honestly for my own and others' good, and to say that I am disappointed does not fully express it.

The hardiness of the Duchess, Tetofsky and Alexander, the beauty and productiveness of the former, and the great size of the latter, had raised the expectations of our northern people to the high point; we expected great things, and my experience leads me to the opinion that we will realize only little things. In the first place they are not hardy like Tetofsky and Duchess, and if any of them are hardy or nearly so, they blight, so that I am afraid to propagate them, and I shall not grow them. If half of the people in the State become afflicted with this Russian mania, I am cured of the disease completely, and shall continue to test these points slowly and cautiously. And if any one who is afflicted with this malady, will continue to buy "Russian fruits" of "Tom, Dick and Harry" for the next five years, I will guarantee a perfect cure, and that he will thereafter have patriotism enough to believe that there are possibilities in the high-flavored fruits of our own country to entitle them to the first place in his esteem.

After relating his experience with individual sorts, he sums up as follows:

1. Mr. Calkins was right when he said there were really none of the Russian apple trees on the market. There is not enough in the whole country to supply one county in Iowa with the trees that would plant its orchards.
2. These trees are not as hardy as they are generally recommended.
3. They are generally subject to blight, though as I have said in a former article, there are a few good growers that are exempt from this disease.
4. They are generally of low quality, not comparing favorably with our American apples in this respect.

And to sum up this article, I make this prediction, and I want every young horticulturist who reads this paper to remember it. That the future successful orchards of Iowa will be planted from seeds that have grown in the soil and climate of Iowa, or the States adjoining it. Exceptions there may be, but only exceptions.

ALTERNATE BEARING.

This is the way the Massachusetts Ploughman puts the matter, and who shall say it is far out of the way:

First, of eighty trees grafted with cions taken from a tree that bore the even year, nearly half of them came into bearing the odd year; and out of eight trees grafted with scions taken from a tree that bears the odd year four of them came into bearing the even year, and have continued so for more than twenty years, and two of the other four have changed so they bear but few the odd year, and one of the remaining two bears more the even than the odd year. Second, a careful examination of a very large number of orchards has failed to convince us that high culture will bring fruit every year. Third, out of thirty-five trees started to bear the odd year in a few years after all but five came into bearing the even year. Fourth, in some cases, in fact in the majority of cases, when the blossoms have been picked clean the even year from trees that have been bearing a number of years the result has been to change the bearing year to the odd year for a few years, when they will come back to their former habits, unless the blossoms are kept picked off the even years. The expense of thus keeping a tree in bearing the odd year is quite as much as the fruit is worth; in fact until we are able to hold better control over the apple worm (codling moth) it is not desirable to change a few trees to bear the odd year, as they only furnish food for the worms, and assist them to propagate their species for the destruction of the fruit the even year.

VARIETIES OF APPLES.

Col. Curtis chats away in the Rural New Yorker in a very pleasant way about varieties of apples. This is how he puts it:

The buyers all want red apples. They say they sell the best. This fancy for color has given Baldwins a boom, as they are red and handle and ship well. There is another advantage for this fruit—the tree is hardy and a constant bearer. I do not like the apple to eat, but on account of its market value and the hardiness of the tree and strong bearing propensity, in an orchard of 100 trees I would plant 75 Baldwins. Too many varieties of fruit are a nuisance. They make an endless amount of work, and many kinds while they have a value for home use are unsuited for keeping or shipping. They do not pay. The Esopus Spitzenburgh, I think, is the daintiest-flavored apple that grows. My mother would have no other for her mince pies and company apple sauce—this had to be extra nice, you know—but since the country has become so open, exposed to the cold winds, the trees winter-kill. The Spitzenburgh wants protection and a virgin soil. The latter requirement can be made up in part by the use of ashes, and the former by planting wind-breaks of evergreens. I treated a stunted Fameuse apple tree twenty years ago with a wheelbarrow load of leached ashes, and that tree shows the benefit of it to this day. Somehow we all like the kinds of apples we used to eat when we were young, and so Rhode Island Greenings, Gilliflowers, and Bellflowers still have a place in our hearts and in my orchard. They bring to mind the times when neighbors used to "come over and spend the evening,"—those old-fashioned, informal visits, in which apples filled an important part of the social cheer. They used to keep company with the doughnuts when we were young.

EVERGREENS IN THE ORCHARD.

A marked feature of the orchards of T. J. Yeomans, of Walworth, N. Y., are the protecting belts of Norway Spruce, running north and south, every 30 or 40 rods. They do much toward breaking the force of the winds sweeping over the hills, and save the fruit when maturing. One autumn just before the time of apple picking there was a furious wind storm, and much was said around town about the quantities of fruit blown off in the orchards around. Mr. Y. sent a large number of hands over to the orchards to pick up the wind-falls for evaporating, but they were soon obliged to return with very little fruit, the wind-break on the west having so well protected the fruit.

TWO PEAR ORCHARDS.

We give in contrast accounts of two pear orchards, the one in Virginia and the other in Wisconsin:

Franklin Davis, the veteran fruit grower of Richmond, Va., gives an account, in his report to the American Pomological Society, of the pear orchard of the Old Dominion Fruit-Growing Company. The ground which it occupies is the south bank, 75 miles below Richmond. The farm belonging to the company contains 500 acres, mostly sandy loam, underlaid with shell-marl from 5 to 15 feet feet below the surface, with a natural drainage. About 18,000 peach trees were planted from 1860 to 1867, but the fruit rotted badly, and the orchard was neglected. At the same time a few pear trees were set out. About 1871 the pear trees gave handsome fruit, which sold well in market. The owner then saw it was the place for pears, and next year set out 1,000 Bartletts. The following spring 400 more Bartletts were added, and 600 Clapp's Favorites. In 1873 the above named company was incorporated, and the farm passed into its hands, with a capital stock of $20,000, in 200 shares of $100 each. Nine thousand more trees were set out the following spring, and the same number a year later. The orchard now numbers over 20,000 trees, over 19,000 are Bartletts. When planted they were one and two year trees, were cut back to a foot from the ground, and were thus made quite low headed, which form was thought to be best suited to that climate. Twenty or thirty acres are annually planted with corn, as much more with peanuts, and the remainder with black peas, plowed under in autumn. This, with the marl, constitutes nearly the only fertilizing.

Clapp's Favorite ripens about the first of July, and the Bartletts from the 10th to the 25th. The fruit is carefully assorted and graded, and packed in boxes holding a bushel each, made of ⅝-inch dressed lumber, and nearly water-tight. It carries better and ripens better in tight boxes. Being gathered ten days before ripe, time is allowed for conveyance to New York and Boston, and for the arrangement of the commission merchant and the retailer.

The company paid $12,000 for the farm, leaving $8,000 for planting trees, and various other expenses. The first dividend was paid in 1880. The pear crop brought $4,000, which with the balance in the treasury from the previous year, gave a cash dividend of 20 per cent on the capital. In 1881, four thousand boxes of pears were sold, with net returns of $13,684, out of which 50 per cent was paid to the stockholders, besides 10 per cent set aside for current expenses. Most of the trees were set out within the last eight years, and are still comparatively small.

J. M. Smith, of Brown county, Wisconsin, talks about the other orchard in the New York Tribune:

In common with other portions of the Northwest, pear culture in Wisconsin cannot be considered a success. I know of one small orchard which is a marked exception to all others in this State. Perhaps Tribune readers may gather from its history some ideas that will help them to success in other places. The orchard is on a ridge about one and a half miles from Green Bay and 150 feet higher than the water. The rows run parallel with the ridge, the trees of one row stand about on the top of it, the others on its southern slope. It was so abrupt that the ground was originally terraced for all except the top row. The soil is a loam by no means rich, but well mixed with limestone pebbles, growing coarser and more plentiful as we go down. Into this soil the trees were very carefully set in 1860 or 1861. I believe some richer soil was put in and around the trees when they were planted. They were very carefully watched and cared for until the spring of 1865; since that time they have had but very little care. The varieties are largely Flemish Beauty, a few Bartletts, and a few of the early kinds. There were originally between fifty and sixty trees, a few of them, perhaps a dozen, dwarfs, the latter now all gone.

The best row and the largest trees—now about ten inches in diameter—are those on the top of the ridge, and they are as thoroughly exposed as possible. Twice since they have stood there the thermometer has gone down to 40° below zero. The trees commenced bearing in 1866, I believe, though it may have been a year later. Since that time there has been no year when they did not produce more or less. I have tried in vain to get some statistics either of the yield in bushels or in dollars, but the owner, like too many of our farmers, is not an expert in book-keeping. This, however, I can say, that I have been familiar with pear-growing in some of the favored sections in New Jersey since my earliest recollection, but I have never seen trees bear as these have done. Two or three years I have seen them so loaded that had they not been propped and braced in every direction, the entire orchard must inevitably have gone to pieces. I have taken friends, visitors, and travelers there upon such occasions, but never yet heard one say that he had ever seen such a yield elsewhere. Two or three trees have died of fire-blight, one or two have apparently borne themselves to death, the remainder—about forty—are still vigorous and promise as well for the future as they have done in the past.

HARDY PEACHES.

Wm. G. Voorheis, of Benzie county, writes Green's Fruit Grower as follows.

In a former letter, I mentioned that the Wheatland peach had reniform glands, and it was a good sign of hardiness. What led my attention to this subject was the common remark that, while my seedlings almost always bear, my budded trees are not sure of doing so. In my experience, some seedlings are not more reliable than budded trees, but the majority of seedlings are, because most of the seedlings breed back to the wild or original type. In that type, vigor and hardiness are more characteristic than size and quality of fruit. Fine quality and size of fruit seems to be at the expense of vitality; this does not always happen. When we can combine both, by careful breeding, we confer a benefit. To do this, we want to notice the peculiarities of each type, and the difference between the hardy and tender sorts.

As a general thing, in the hardy sorts, we observe the leaves almost always have large reniform glands, the flowers are large, the flower-buds medium, or small, pointed and harder than the tender type: that is, the buds are more compact or dense in the tender sorts; he will find that the leaves are larger, and, as a rule, with small or globose glands; the flower-buds are more rounded, larger, and lack that firmness which is peculiar to the hardy type; also, the flowers are almost always small. To my mind, the reason is plain,—why the one kind is more hardy than the other.

The petals of the large flowering varieties are a better protection to the embryo, from the cold; as the fruit bud is more dense or compact, the embryo is more securely wrapped up and protected than the other; the buds of tender sorts, on the other hand, are so loose and open that if it is colder than usual they perish.

With me, peaches like the Jacques Rareripe are more profitable than those of the Crawford type. I think it is better to have a full crop of fair quality than it is to have a very small crop of extra quality; then, too, in those years when peaches are peaches, one will find that, while those of the Crawford type will bear scarcely any or none at all, the others will carry all that they ought to bear.

EARLY PEACHES.

H. M. Engle, of Marietta, Penn., states in the Gardener's Monthly that he has fruited this season twenty-six varieties of peaches claimed to be from one to three weeks earlier than Hales. He has settled down to the firm conclusion that there is not three days' difference in time of ripening the following varieties, viz.: Amsden, Alexander, Wilder, Musser, Bowers's Early, Baker's Early, Alpha, Gov. Garland, Sherfey's Early, Nectar, Early Canada, Waterloo, Downing, Saunders, Cumberland, Honeywell, Climax, Briggs's May, and a seedling of his own, known as No. 4. All the above named varieties are just over, while Early Beatrice, Louisa, and Early Rivers are just coming in. He picked the first ripe peaches about the 22d of July, while two years ago the first were ripe about the 26th of June. Early Surprise is just coloring, and will ripen about with Hales. Early Rose and Early Lydia quite green. Flater's St. John, said to be the earliest yellow peach, will ripen, he thinks, with Troth.

SUCCESS WITH SMALL FRUITS.

E. P. Roe says that the secret of success in small fruit culture is found in two words, stimulation, restriction. By stimulation he means a thoroughly pulverized and enriched soil. This is especially essential to the strawberry, the foreign raspberry, and all the currants. A rampant growing raspberry like the Cuthbert or Turner, and our vigorous blackberries, do not require stimulation, but they do restriction. By restriction is meant the development of fruit rather than wood or vines. Set out a strawberry plant in very deep, rich, moist soil, and its first tendency is to follow the great law of nature, and propagate itself, but to the degree that it makes plants it cannot make fruit. Cut off every runner and enormous fruit buds are developed. The sap is dammed up as a miller restricts a stream, and the result is strawberries that are double in size and quantity. This is equally true of raspberries. Currant bushes crowded with wood bear little fruit.

TRANSPLANTING RASPBERRIES.

P. E. Bucke, an authority upon fruit matters at Ottawa, Canada, says:

A couple of years ago the transplantation of raspberries was recommended in August, when the young plants were in full leaf. This paragraph was copied into a large number of papers, and was eventually sent me by a friend all the way from California. Further experiments this year in the direction of early planting revealed the fact that July is a better month than August; and in future the writer will make his plantations in June if the plants are to be had from three to four inches high. Every one knows who has tried it that late autumn or spring planting, cutting the canes to four or six inches long, does not result in a good plant the first bearing year: the canes are branchy, and as a rule not very strong. But by the early system of moving plants a good cane is obtained the first year, and the following one a good supply of fruit, thus gaining almost two years on the old system. Try it.

LARGE CROPS OF STRAWBERRIES.

President O. B. Galusha, of the Illinois Horticultural Society, contributes to Farmer and Fruit-grower his method of management: "As it may again be of service, I will again tell how I raised at the rate of 15,000 quarts per acre of Crescent strawberries (I have not said I raised a full acre at this rate), and also how I raised at the rate of 9,664 quarts of Wilsons per acre. The Wilsons measured were grown inside a square of 16½ feet on a side, marked by narrow strips of boards on edge around it. The whole patch, of about one-sixth of an acre, however, was treated to the same kind and amount of food. The year previous the plants were set about three and a half feet by one foot in land pretty well enriched by manure and thoroughly pulverized to a depth of twelve to fifteen inches. As the runners appeared, they were layered so as to have the ground covered in the fall by plants about three inches apart. Each layering was followed by a sprinkling of wood ashes (a general watering, if needed), and a watering of the new layers with a weak liquid manure made by leaching rich barnyard manure and diluting it. The bed was well covered over in winter; in spring the mulch was removed and a good sowing of ashes applied.

The patch (about twenty rods of ground) of Crescents from which berries were grown "at the rate of 15,000 quarts per acre," was the first crop, and the preparation the previous year was similar except that superphosphate, ashes, and hen manure were used in making the liquid manure, which was applied quite frequently during the season of growth and three or four times in spring before the berries were formed.

Surely no one would be so foolish as to claim that even 10,000 quarts of berries per acre of any known variety can certainly be realized from ordinary field culture. I will add that I raised 11,176 well-rooted plants, by actual count, from thirteen plants of Crescent set out on the sixth day of May, the following autumn being unusually favorable for their development. The plants were set ten feet apart each way, and entirely covered the ground before freezing weather. No "belt" is wanted. I do not compete for championship of any kind; but take pleasure in testing the capabilities of various plants both for growth and productiveness.

The experiment with the Wilson was made from the first plants sent out from Mr. Wilson himself. This was about twenty-five years ago, I think, and the result was then published. I cannot now get over 3,000 quarts of Wilson per acre, with good care. Russell's Prolific, on very rich ground, has yielded nearly the same as the test crop of Wilsons; yet I have discarded it as it is too soft and uncertain.

A STRAWBERRY ESTIMATE.

P. M. Auger, State pomologist of Connecticut, gives the following estimate of three varieties of strawberries under his treatment:

The Manchester, in our opinion, is bound to take a leading place among market varieties. Of its productiveness we are well convinced; a single plant, June 28, after picking several ripe berries, gave a count of 125 berries remaining in different stages of growth. Imagine those all to swell out and ripen and count fifty to a quart, and you have as great a yield as one could well ask from one plant. The berry is very uniform in size and form, and if we mistake not will be soon quoted as a leading market berry. We intend planting it largely ourselves this fall. Crescent has been called the poor man's berry, the lazy man's berry, etc., and well merits the names. The yield under favorable circumstances is indeed enormous, we might almost say unequaled. The fruit is very good or very poor, according to treatment. With high culture and good management the fruit is medium size, well colored, and good, while in a tangled mat, neglected, the fruit is small, soft, and poor. It should always alternate in rows with a good pollenizer, such as Wilson or Charles Downing. The Wilson with us this year has done its very best, and has caused exclamations by its wonderful load of fruit; has produced a larger aggregate of fruit than any other variety. But the future is to tell a different story. Hybridizers will never be content till we have a berry as productive as the Wilson ever was, as good a shipper, and in quality equal to the best.

STRAWBERRY FARMING.

In the Home Farm we read of J. A. Tolman's method of raising strawberries in Maine for the Boston market:

Coarse marsh hay is placed between the rows before blossoming time to keep the berries clean. As soon as the harvest is over the mulch is forked up in piles and hauled off. It is considerable work to handle it, but he has found that it more than pays. Then he goes through with a sharp-cutting cultivator and cuts the rows down to about one foot in width of plants, cutting off all the runners, then cultivates through the rows to remove all weeds, and as soon as it can be done after the crop is harvested, or at any rate in the fall, manures with about eight cords of old stable manure. This is worked in with a fine, spike-toothed cultivator, the teeth running deep and not throwing the earth toward the plants. A harrow-toothed cultivator is better for this purpose than one with plow-shaped teeth. He covers in the fall just as soon as the ground freezes. He has become satisfied that evergreen boughs are the best protection. They do not lie down too close, and he thinks them better than marsh hay. He lets them remain on till about the 10th of May—it is wrong to remove them too early in the spring.

Some kinds bear a very heavy crop for one year and then do not seem to do so well afterward. The Wilson, especially if it bears a heavy crop, appears to have its vitality exhausted. The Crescent will do fairly for two or three years, but in his practice he renews all fields after the second crop—that is to say, he sets an acre each year and after a field has yielded two crops he puts the land into something else. A little experiment in irrigating the plants was tried this season. On the sides of the mountain west of the road reservoirs were formed in natural basins by raising an embankment and storing the water occasioned by surface drainage and meltings of snow last spring. This was kept back and let on to the strawberry fields by means of open furrows during a dry period. The result was so satisfactory that systematic irrigation will no doubt be one of the future means of success.

PLANTING OUT STRAWBERRIES.

President Galusha tells the Farmer's Review how he has "luck" in transplanting strawberries on a large scale. He says:

Mark the ground by stretching a cord where the row is wanted, walking over it and then removing it, making the lines three and a half or four feet apart, so that cultivation can be given with a horse cultivator. Keep the roots of the plants constantly in damp earth or moss until taken out, one at a time, for planting, clip off all leaves but one (or two at most), the youngest; make the holes along the line with a spade, placing the back of the spade to the line, thrusting its full length perpendicularly into the ground, and with a sidewise motion remove the earth, leaving it close at hand for use in setting the plant. This leaves a perpendicular cut exactly on the line. Spread out the roots fan-shaped, and place them against this cut so that the roots will be straight (not doubled up), and the crowns of the plants, or upper buds, on a level with the general surface of the ground. I emphasize this point because it is the most important one in the whole operation; for if too deep a long or hard rain will cover the crowns and cause them to rot; and if planted too high an ensuing drouth will dry them to death. Draw the fresh earth against the roots and press it firmly by a moderate blow with the fist, then fill the hole nearly full of fine earth, and follow by filling entirely with water or a weak liquid manure. When the water has disappeared level up around the plant with loose fine earth, leaving the surface loose. Thus planted, nine out of every ten plants will grow. No shading is needed if the leaves are removed. I have never had better success than when not a leaf was left on the plants when set out, as the leaves rapidly evaporate the sap from the plants, and in dry, hot weather often cause death before root-growth has commenced.

COMPELLING STRAWBERRIES TO FRUIT.

The following caught our eye when looking over a copy of the Colorado Farmer:

Having heard or read, that for every runner that was cut off a fruit stem would be formed on the old stool, and that as many berries and of large size would be obtained from hills or stools, than when allowed to run over the bed, we thoroughly tested the matter, and became satisfied that it would hold good. It will be found that varieties like the Crescent that are very profuse in runners, will "stool" out wonderfully when the runners are kept off, and of course, the more they "stool out" the more fruit stems and the greater the crop. Too many suppose that by allowing a plant to run and getting ten, twenty, or thirty plants formed around it, thereby they get a proportionally larger crop, forgetting that the strength that is given to runners would go to the old plant if not allowed to run, and there is such a thing as covering too much of the space. Plant your Crescents in the garden and keep off all runners, and you will be astonished at the crop of fruit you will get.

THE WILSON STRAWBERRY.

A fruit portfolio would look lonesome without something about the much abused Wilson, so we quote this item from our venerable friend, S. B. Peck, of Muskegon:

From being hailed on its advent and during the first few years of its dissemination as a great boon, the Wilson strawberry, after heading the list and leading the market for years, has at last become a reproach; and it has even been suggested to send missionaries to those places where there are no better sorts. And why? Simply because we can by extra exertions raise kinds that are bigger and sweeter, and still it is quite doubtful whether any of those later, larger, and sweeter kinds will show on a chemical analysis as great a proportion of sugar as this old Wilson. The sweet or sour taste in fruits does not depend so much on the amount of sugar they contain as on their proportion of sugar to acid. The Clinton grape, so highly detested by many for its extreme acridity on its first coloring, shows on analysis when ripe, a greater per cent of sugar than most other popular varieties. The sugars and acids of fruit consist of the same elements—carbon, hydrogen, and oxygen. These sugars and acids being of the same chemical elements, the arch chemist, nature, in the process cf ripening fruits in her private laboratory, readily changes a portion of their acid to sugar, so that the process of ripening is in the perfection of the seeds for the perpetuation of the plant and adjusting its ingredients to the wants of man and the lower animals—literally changing the acid to sugar. And so we never get a perfect fruit till it is perfectly ripe, and that's what's the matter with the Wilson. It has in my opinion more of the real elements of fruit than any of the larger kinds, the increased size of the latter being made up of an increased quantity of water alone.

Growers for the market know that it is always marketed before it is fully colored, and when they partake of it themselves, they always select the ripe ones. I am well aware that many palates are better suited with these large, diluted berries, but I consider that an evidence of a weak stomach, for I have always noticed that as a rule the healthiest persons have the least taste for sweets. I was one of the first to introduce this berry into my neighborhood, and I have ever since watched it and such of its rivals as have come within my reach, and I believe at this late day that there has been no new fruit of any kind introduced into the Northern States that is as great an improvement over pre-existing kinds as this very Wilson strawberry. While it bears with patience and fortitude every kind of abuse and neglect, it readily responds to judicious culture even on our light and almost blowing sands, without manure. I have even come to the conclusion that for this berry on our light soil the application of any barn yard manure does not compensate for the grass and weeds it introduces, but that a frequent stirring of one or two inches of the surface at a proper time gives triple compensation.

CHAMPION AND WINDSOR CHIEF.

President T. T. Lyon says the Windsor Chief, which was shown at our June meeting two years since, seems on all hands to have won the reputation of being the Champion and only the Champion. It was supposed that such a charge, so frequently reiterated, would doubtless win from its alleged originator a defense or at least an explanation, but as nothing of this kind seems to have appeared, the result must naturally be to increase the suspicion that such defense is impossible—in other words that the Windsor Chief is a myth.

Granville Cowing, of Muncie, Indiana, says: I have fruited them for two seasons within four feet of each other, and have never been able to detect the slightest difference in any respect between them. Eight or nine years ago I received plants of Champion from Mr. John Saul, of Washington, D. C., several years before Windsor Chief was heard of. Windsor Chief was first generally presented to the public by Samuel Miller, of Bluffton, Mo., the originator of Capt. Jack, and an intelligent fruit grower, who was much impressed by its merits, but who, I believe, at that time, had neither seen nor fruited Champion. Mr. Miller, I believe, received his plants of Windsor Chief from a gentleman in Michigan, who claimed to have grown it from seed, and from Mr. Miller I received my plants of it. Possibly the experienced fruit growers who have found such a difference between these varieties may have begun with spurious plants of Champion.

Geo. W. Bridgman, of Berrien county, Michigan, says: If it be true that the Windsor is a direct descendant of the Charles Downing and the Champion, certainly its parentage would premise a successful future for the variety, so far as latest probabilities based upon blood are concerned. I concede that the weight of published testimony apparently tends to show that the Windsor is simply the old Champion Strawberry, under a new name. It would be presumption to treat with disrespect the opinions of gentlemen, eminent as pomologists, who insist that they can discover no difference between the Champion and the Windsor; but there is surely mistake or mystery about this variety somewhere. It was my fortune to be a member of the Committee on Fruits, at the meeting of the State Pomological Society at Muskegon, where this variety was first brought to the attention of and named by the society. See Pomological Report, 1879. If there was one strawberry more than another with which that committee had an affectionate acquaintance, that berry was the Champion; and it is, to say the least, problematical that such veteran pomologists as Mr. Buell and Mr. Holt should have been deceived.

Mr. Gardner, who claims to have originated this berry, was I think a stranger to every member of the committee; he was not present at the meeting, but forwarded to the society by express about two quarts of the ripe fruit, each berry being almost the exact counterpart of the other in color, size, and form; as nearly alike as peas from the same pod.

In the fall of 1879 Mr. Gardner sent me seven plants, which were set upon dry, sandy soil, during the extreme drouth. Every plant lived, but no especial attention or examination was given until after the variety had been called in question.

It is true that the plant with me bears striking resemblance to the Champion, but I think there is a little difference in the color of the leaf. The Windsor seems to be a stronger grower than the Champion, and tends to make wider rows, and on the same soil to have more fibrous roots.

During the winter of '81 and '82, in the same field, a row of Champion was nearly destroyed by heaving, while the Windsor came through comparatively uninjured.

An examination with a glass of a number of the blossoms in 1881 revealed what seemed to be stamens supplied with pollen, quite different from the Champion. The fruit when ripened was unusually even in size and regular in form, approximating very closely in appearance to the sample exhibited at Muskegon, while with me the Champion delights to show its finest specimens odd and irregular.

JAMES VICK STRAWBERRY.

Inasmuch as the James Vick is brought to prominent notice this year we give the following estimate of it made by P. C. Reynolds of Rochester, New York, who visited various plantations:

One of the first things that struck you in looking upon the fruit, next to numbers, was uniformity in size. There were no enormously large specimens and no small, but all large. The color was bright, deepening from scarlet in those just coloring to crimson in those fully ripe. The form is nearly round with a slight tendency to conical. A milk pan full of these berries which had just been picked on another plantation which we visited the next day were a fine sight to behold. All large, bright, handsome, no need of topping off.

Now as to the quality of the berry. Eaten when it first reddens it has a quite sharp acid taste, modified by the presence of a large proportion of sugar, reminding you of sour fruit preserved in sugar. It gives it a lively flavor very different from the dull sour of many kinds of strawberries. Now select one that has assumed a crimson hue and the sugar has so gained upon the acid as to give you quite a sweet, sprightly, high-flavored berry—a berry of which you could eat many without their palling upon the sense. As to firmness, while less firm than Wilson or Triomphe, those highest types of firmness in strawberries, it would compare favorably, we should think, with most other varieties. We never yet had the pleasure of becoming acquainted with another strawberry that would bear the handling and keeping of the old Triomphe, and we fear we shall have to wait a long time before we see another like it.

THE TURNER.

Hon. Parker Earle thinks the raspberry to take the place of the Turner as a reliable market berry, in all soils and latitudes, has probably not yet been introduced. When it comes it must possess wonderful excellence. He suspects that if a syndicate of Jersey nurserymen were now bringing out the Turner, more fine and yet true things would be said of it than we commonly read in catalogues.

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Farmer and Fruit Grower of Anna, Illinois, seems to be of the same opinion, for it remarks: When properly cultivated and properly handled, the Turner has proved most decidedly the best red raspberry for either home or distant markets. It has every needed quality except firmness, and if picked at the right time it is firm enough to send 500 miles in perfect order. Our growers ship them from this station to Chicago, Milwaukee, Dubuque, and more remote points, without hesitation.

THE TYLER BLACK-CAP.

J. E. Burr, of Cayuga county, N. Y., writes to the Indiana Farmer:

"Among all the new candidates for public favor this raspberry is, I think, one of the most valuable that has yet been introduced. It is a Black-Cap, originating in this State, and has been quietly planted and grown here for a number of years past. One large fruit-grower near has several acres of it in bearing, claiming that it is by far the most profitable sort he can raise, and several others have planted it almost exclusively the past year or two. One of its chief points of value lies in its earliness, it being as early or earlier than either Doolittle or Davidson's Thornless. It will average as large or larger than Mammoth Cluster, in fact, I have seen many of its berries as large as the largest Gregg I ever saw. It is the handsomest jet blackberry I have ever seen, there being scarcely a trace of bloom on them, while the seeds are remarkably small and few in number. Although exceedingly firm the berry is not dry or hard, but juicy and of very fine quality. It is a strong, vigorous, healthy plant, and enormously productive. In a test of six rows each of Davidson's Thornless and Tyler, planted at the same time and each receiving exactly the same treatment, there were picked from the former six rows, one bushel and two quarts, and from the Tyler exactly six bushels, or one bushel to the row. This was on the grounds of a neighboring fruit-grower who in his enthusiasm is about to uproot a fine young plantation of other varieties and replant them with Tyler. In the Auburn markets it commands an average of three cents per quart more than other varieties on account of its quality and handsome appearance. I think it is by far the best berry of its season and effectually displaces the Doolittle and Thornless, thus supplying a long felt want, and I have no doubt that as soon as it becomes better known it will be planted more extensively than any other, and I see no reason why its merits should not be made known as were those of many inferior sorts that are now being puffed and lauded through the country. The Gregg, our best late sort, commences to ripen at about the last picking of Tyler, and thus by planting these two varieties the season may be greatly prolonged, while I believe that two more profitable sorts cannot be grown."

THREE BLACKBERRIES.

Granville Cowing, of Muncie, Indiana, says but three varieties of blackberries—Snyder, Wallace, and Taylor's Prolific,—have thus far proved profitable in this latitude. They are more hardy than any others, and have often passed through severe winters and perfected a crop of fruit, where all other kinds were killed to the ground. Last winter, for the first time since their introduction, they were much injured by a combination of drouth and intense frost, and produced but few berries; but such a winter was never before seen by the oldest inhabitant and may not be repeated during the present generation. Of the three, Taylor's Prolific proved to be the most tender; but it cannot be dispensed with on that account, because it is only the very late variety that will generally pass through our winters in good condition. Snyder ripens about ten days before Wallace and two weeks before Taylor's prolific. They are all remarkably productive of the best flavor, and wholly free from rust, so destructive to Kittatinny and Western Triumph. Snyder and Wallace are strong upright growers, with large round leathery leaves, much alike in general appearance and wholly unlike any other variety. Wallace is quite as hardy as Snyder, and when its worth becomes fully known it will no doubt be extensively planted. Its berries are long and slightly larger than those of Taylor's Prolific, which are also larger than those of Snyder.

GROWING CURRANTS.

One who has had experience tells the Practical Farmer how to profitably grow a half acre of currants:

A piece of land fitted to produce a good crop of potatoes is in a good condition to set to currants. To set them four by five feet will require about one thousand two hundred bushes, and they should cost about $5 per hundred, or

$60. During the first season potatoes may be planted between the rows and between the bushes without materially injuring the growth of the bushes or the yield of the potatoes. During the second year beans may be planted between the rows, which, with what fruit is obtained, should pay the original $60. And the third year they should produce one pound and a half to the bush, which, at six cents per pound, would amount to $108. After the bush has attained its growth with good culture a fair average yield would be about three pounds to the bush, which, at six cents per pound, would amount to $216. The expenses for labor and manure annually would not vary materially from that required on half an acre of potatoes after they were planted.

GRAPE GROWERS' MAXIMS.

The Vine Dresser gives the following maxims for vineyardists:

First—Prepare the ground in fall; plant in spring;

Second—Give the vine plenty of manure, old and well decomposed; for fresh manure excites growth, but does not mature it;

Third—Luxuriant growth does not always insure fruit;

Fourth—Dig deep, but plant shallow;

Fifth—Young vines produce beautiful fruit, but old vines produce the richest;

Sixth—Prune in autumn in order to insure growth, but in spring to promote fruitfulness;

Seventh—Plant your vines before you put trellises;

Eighth—Vines, like old soldiers, should have good arms;

Ninth—Prune spurs to one developed bud, for the nearer the old wood the higher flavored the fruit;

Tenth—Those who prune long must soon climb;

Eleventh—Vine leaves love the sun, the fruit the shade;

Twelfth—Every leaf has a bud at the base, and either a bunch of fruit or a tendril opposite it;

Thirteenth—A tendril is an abortive fruit bunch—a bunch of fruit a productive tendril;

Fourteenth—A bunch of grapes without a healthy leaf opposite is like a ship at sea without a rudder—it can't come to port;

Fifteen—Laterals are like politicians—if not checked they are the worst of thieves.

MANAGEMENT OF GRAPES.

J. N. Stearns, of Kalamazoo, gives us his method of managing grapes:

I plant my vines eight feet each way, which is plenty far enough for my mode of pruning. I prefer to plant in the fall if convenient, and just before winter sets in put a forkful of coarse manure over the vine. If the manure is not at hand, a shovelful of soil will do. The first year I allow the vine to grow at will, giving it good cultivation. In the fall prune it back close, but be sure and leave enough to get two good buds, allowing them to grow the next spring, and rub off all others as they start. Tie the two to a stake as they grow, and as before, keep well cultivated; in fact, a vineyard should always receive as good cultivation as a field of corn would, to obtain the best results.

In the fall, after a hard frost, cut these two canes back to within three to four feet, and they may be allowed to fruit a little the next year, but should they set too much, should be thinned off. This year I let from three to four canes grow from near the ground, and rub off all their sprouts. In the fall cut off the two canes that grew the year before, close down to the ones grown this year. By this time the vines are ready to bear quite a crop, and a trellis should be prepared for them, which will give much better satisfaction than if tied to stakes.

The next spring allow from four to six canes to grow, always from near the ground. In the fall cut off those that have borne this year in the same manner as directed the year before. At this stage the vine is in full bearing, and the same process is pursued every year, after allowing from four to six new canes to grow, and cutting out all those fruiting the present year. This is called the renewal system. I have practiced it for fifteen years. There are more vineyards in this vicinity pruned on the spur system, but all seeing my grapes this season, and testing their quality, pronounced them superior to any they ever saw. Never summer prune, no matter who directs it. Just as well tell you to shut off part of your lungs.

My ground is a sandy loam, prepared as I would for corn; would not produce over thirty bushels of corn when grapes were planted. Have never put on any manure, until this year I spread over the vineyard ashes and salt mixed, one-third salt to two-thirds ashes, about thirty bushels to the acre.

BAGGING GRAPES.

R. A. Waterberry, from experience in bagging more than 3,000 clusters of grapes, compiles the following advantages which appear in the Rural New Yorker:

1. The sacks retarded the ripening of the fruit slightly.
2. A variety sacked early, in several instances ripened earlier than the same variety inclosed later.
3. The color, size, bloom, and quality of most varieties were improved by the operation.
4. They were kept from cracking, cooking, and decaying, and protected from the attacks of the birds, wasps, ants, and bees, and, I may add, from the bugs, when all the clusters upon a vine were done up.
5. The grapes were protected from frosts; some late clusters ripened up fully after the leaves had partly fallen.
6. I kept some clusters upon the vines in prime condition until November, even through a temperature which formed ice upon water.
7. I found by experience that I could pin the bags on much faster than I could tie them.
8. After singling out the cluster I carefully slipped the sack on with both hands, folded the left corner over the left forefinger, held it between said finger and left thumb, then folded the right corner and held it by the same finger vice, and pinned, being careful to fold corners close up to the fruit stems to keep out little tourists.
9. Before separating the sacks from their packages, while firmly packed together and somewhat stiff, with a sharp knife I cut a little groove across the

thickness of the package, thereby making a little notch at the center of the bottom of each sack.

10. I picked my grapes into large baskets with the sacks upon them, and placed them in an airy, cool room upon shelves and tables, and took them out of the sacks principally only for market and use.

11. Perhaps it was fancy, but the thinner the skin and the more delicate the grape, the greater seemed to be the gain from sacking.

12. I left some sweet, very early varieties to hang late upon the vines, and when taken out they had been nicely evaporated, and but for poverty of pulp would be called good raisins.

GRAPE VINE SUPPORTS.

Mr. R. Reed, of Wayne county, Illinois, contributes the following to the Prairie Farmer:

Set a post of good material in the ground, 2½ or 3 feet—3 feet out—say, 4 feet from the vine-root. If the vine is a variety of thrifty growth it would require two posts three or four feet apart. Bolt to the posts in the ground a scantling of any desirable hight—8 feet or more—with a bolt near the top of ground in the short post, and another near the top of said post. When the vine has attained sufficient length cut a notch in the scantling above the top of the post large enough for the vine, and put the vine in and nail a piece of lath over it; then after it has attained sufficient length bend it at the distance of two or three feet and bring it back through another notch, and so on till you fill up the post, putting them some twenty or twenty-four inches apart. If it is thought best to use two posts nail a piece of fence board from the top of one post to the other.

The advantages are: First, It makes the vine its own trellis. Second, To trim the vine or pick the fruit set a trestle, pull out the lower bolt, and turn it down on the trestle, and it is easily got at. Third, If desirable to have the lower buds start their growth first (as the upper ones generally outgrow the lower ones) pull out the lower bolt, and leave the top on the ground until a sufficient advance is made. Fourth, If desirable to sulphur or smoke for mildew, with other materials, it can be more easily done if turned down on the trellis. Fifth, If the vine is a tender variety, by taking out the upper pin and laying the vine on the ground, it can be covered by some material that will protect it from the severe exposure. Sixth, If a night of frost appears to be coming after the buds have started by laying the vines down and covering with carpet or other material they may be protected. Seventh, If it is desirable to grow a number of layers from a vine by laying it flat it gives a superior opportunity. I believe there are advantages in it that are desirable, and they may make the growing of tender varieties a better success.

CULTIVATION, PRUNING, THINNING, AND MULCHING.

CULTIVATION AND MOISTURE.

The Western Farmer gives the following figures to show the advantage of deep cultivation: Take 1,000 tons of soil and dry it in its packed state, then expose it to an ordinary summer's atmosphere for 24 hours, and the absorption of moisture will be found in sandy loam equal to about five tons, clay loam seven tons, and garden mold twelve tons. Take the same soil, thoroughly pulverize and dry it, and then expose it in like manner to the other, and the sandy loam will absorb 26 tons, clay loam 30 tons, and the garden mold 45 tons. Thus it will be seen that the latter process is a guarantee against drought, to say nothing of allowing the roots of plants free scope to grow and seek nourishment for the plant, which they could not otherwise do. The saving of manure will be an item of importance, and the increase in production incredible. When the subsoil is clay, it will require several years of deep cultivation to thoroughly amalgamate it with the top soil, but once done, the productiveness of it will repay for the trouble and time taken to do it.

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On the other hand, the New England Homestead talks about the danger of deep culture in certain cases, as follows: Fruit-growers must be reminded that their hoes, cultivators, and plows may do more damage to plants than good, if not used with discretion. The small fruits—berries, currants, grapes, also dwarf pears, quinces, etc., root near the surface. Here are found the best roots, those that provide most nourishment. Nature designed these to be mulched by the dead leaves, and in our fields mulching would be the best treatment if it were possible. As it is the best we can do is to give frequent shallow cultivation. I have seen intelligent men plowing deep furrows alongside of their raspberries, currents, and grapes, well satisfied that they were doing thorough work that would secure an abundant harvest. Let such men dig up one plant before thus plowing and one after, and see what butchery they have committed. There are no tap roots stretching far down into the subsoil, but simply a few laterals branching out say from two to four inches below the surface, and more than half of these have been sacrificed by the plowshare. When we set green hands hoeing strawberries and newly-set raspberries we know what they will do if not watched—they will destroy half their roots and loosen the hold for life that the struggling plants have secured by chopping close about them.

CULTIVATION AND DROUTH.

Patrick Barry in his address before the Western New York Horticultural Society, of which he is president, said:

And now let us consider very briefly what the cultivator may do to avert the ill effects of a drouth such as that of last summer. The most effectual and practical means within my knowledge is the constant and thorough tillage of the soil. According to my observation wherever the soil was kept finely pulverized and stirred by the horse-hoe or cultivator, or if in the garden with a good steel rake, at least once a week, the most severe drouths we ever experience here do very little harm. I have never seen better growth of nursery trees than during the past summer, and this is always the case in a dry season, with thorough cultivation. I have noticed the same effects in orchards. Where the ground was cultivated well the trees remained healthy in foliage and matured their fruit, whilst those not cultivated dropped both foliage and fruit to a great extent, and at the same time were injured for the future. The same effect has been observed in farm crops. When in California we were told by fruit growers that the first impression there was that no fruit could be grown without irrigation, but they had ascertained by experience that for trees irrigation was unnecessary. Thorough cultivation was sufficient, and in the most flourishing plantations we visited, the ground was kept so fine and loose that we sank into it over our shoes. We were surprised at the result.

PRUNING THE VINE.

Mr. Geo. W. Campbell, the able Secretary of the Ohio Horticultural Society, gives the Rural New Yorker his plan of pruning the grape, which we reproduce here:

In my own practice, I prefer what is called the "annual renewal system," which allows a young vine in its first fruiting to bear no more than it can bring to maturity, and at the same time grow one or more strong and healthy canes from as near the ground as practicable for next year's bearing. The bearing wood of the present year is cut away and the new wood takes its place. This practice, with slight modifications, is continued during the life of the vine, is readily understood and applied, and a little observation and experience render it quite simple and easily performed.

A cultivated vine is in an artificial condition, and all its energies are directed toward the production of the greatest quantity of fruit within its alloted space; and some vines respond so readily to this artificial treatment that they are disposed to overbear, and set more fruit than they can mature. Attempting to grow too much fruit may so overtax the powers of the vine that it can neither ripen its grapes nor mature its wood perfectly for next year's bearing. Vines so treated are unhealthy and short-lived. It is better, however, to avoid the evil of overbearing by thinning out the fruit, especially all the small and imperfect bunches, than by too close pruning; for an abundance of healthy foliage is necessary for the ripening process.

The summer treatment consists in thinning out the fruit upon vines disposed to overbear; early pinching off the ends of fruit-bearing shoots two or three joints beyond the last cluster, and then removing all superfluous shoots except what are started from below and are needed for next year's bearing. This, with an occasional pinching of the end of a too rampant shoot will be all that is required. And when one has learned so to gauge the capacities of his vines as to bring each year his crop of fruit to perfect maturity and at the same time have a sufficiency of sound wood for the next year's crop, he has learned all that is necessary for successful grape culture.

FACTS ABOUT PRUNING.

From Coleman's Rural World we extract this bit of information:

We look upon the roots as the parts that nourish, but the roots are the mouths through which food is taken. It is more correct to say that the stomach nourishes rather than the mouth, and the leaves of the tree rather than the roots. Some people seek to urge the growth of cions in newly grafted trees by removing all large limbs. They should remember that they thus remove that which induces growth, and after such severe slaughter many of the fibrous roots will be found dead, for if they have no work to perform they become feeble and short lived. We must distinguish the difference between trees and vines. If we wish the grape to grow vigorously, we cut it back closely, for its leaves are very large, and it has the faculty of covering a trellis with only a few buds. Thus we cut feeble growing vines back more closely than strong growing, for by close cutting we get more foliage than by leaving canes long. Therefore, in pruning trees the danger lies in cutting too much, and with vines in not cutting away enough. If you wish the tree to spread, cut to an outside bud; if to run higher and closer, to an upper or inside bud. Leave no crotches, as they are certain to break when laden. Cut close to the shoulder, but do not cut the shoulder. Remember that he who does not trim at all gets the most growth of tree; yet he who trims often and wisely has the best orchard and fattest pocket-book.

OPENING UP TO THE LIGHT.

The practice of summer pruning grapes to give the fruit light, that it may mature and color better, is still practiced somewhat, and Josiah Cooper, in the New York Tribune, shows clearly the fallacy of the idea:

No surer evidence of the impropriety of defoliation to admit the sun's rays can be cited than the results of recent experiments in bagging grapes. We see that the covered clusters ripen more thoroughly, color more beautifully, and assume that charming bloom which, without artificial aid, in many sections, they rarely attain. The foliage in a great measure acts as the lungs do in the animal creation, and every perfect healthy leaf taken off a plant destroys a portion at least of its power of subsistence, for vegetation extracts from the air a wonderful amount of nutriment which enters into its organism through the myriads of minute apertures which nature has so wisely ordained for this express purpose. Then why partially cut off its means of supply to gratify the whim that fruit must receive the direct rays of the sun?

TRIMMING THAT INJURES.

"Leon" in Rural New Yorker makes a point that we would like to see made at least once a year in every agricultural newspaper in the land. This is no place for carrying out the Japanese method of making trees into monstrosities. "Leon" remarks:

I was at Marshall, Michigan, some weeks ago, and friend Powers drove me all around the city and for miles through the neighboring country, and a lovely agricultural country it is, too, I assure you. We halted in front of a suburban residence with a large yard containing a good many evergreen trees, as spruces, which were "trimmed up in good shape" into solid bushes. This was pointed out to me as the most noteworthy garden at Marshall and the trimmed trees were its forte. But I didn't think so. A spruce in its full development is a handsome, noble looking tree, but robbed of its natural inclination, symmetry and order, it becomes an abnormal absurdity. You can obtain more enjoyment from the possession of one really well-developed, handsome tree than from ninety and nine that have been clipped to deformity.

SHORTENING IN.

Mr. Downing long ago wrote, that the peach bears pruning especially well; and even late in the spring, when it is unsafe to prune many trees because the fresh wounds continue to bleed. A laborer can be shown in five minutes how to prune a whole orchard, for the best course is simply to shorten back all the strongest shoots, over the top of the tree, one-half. The philosophy of this is that the later formed buds seldom set fruit but drop off, while the best peaches are obtained from the stout triple buds that have been first formed low down on the shoot (early in the season's growth). The side-shoots that grow out of strong leaders as a second growth are not so apt to hold their fruit as the slender shoots, often covered with fruit buds alone, which have issued lower down and earlier, and which dry up after bearing, and in time drop off. This pruning enables the tree to carry its burden more safely, and facilitates picking, besides conserving the health of the tree by removing the half-ripened wood liable to disease. This principle in pruning, of cutting away before the spring sap flows, all unripe wood liable to injury by the winter, is applicable to other trees than the peach. The pear is especially safe-guarded by it, and grape vines, Antwerp raspberries, and half hardy roses, will grow much better by having this source of decay and corrupting sap removed. Its viris is comparable to that of unhealthy pus absorbed by the blood, and spreading pyæmia through every vein.

PRUNING SHRUBS.

We are indebted to Ellwanger & Barry's descriptive catalogue for the following excellent suggestions concerning the pruning of shrubs:

Pruning, as sometimes practiced, has the effect to render trees and shrubs unnatural and inelegant, by shearing into cones, pyramids and other unnatural shapes. Every tree and shrub has a habit of growth peculiar to itself, and this peculiarity is one of its beauties. If we prune all alike into regular shapes, we destroy their identity. The pruning-knife, therefore, should be used and handled with judgment to lop off straggling branches. Shearing may be practiced on hedges, but never on trees and shrubs.

While symmetry and regularity of form are to be admired in a shrub, this quality should never be gained at the expense of health and natural grace. wiegelias, deutzias, forsythias, and mock orange, flower on the wood of the preceding year's growth, and hence these shrubs should not be pruned in winter and spring, but in June after they have finished flowering, when the old wood should be shortened or cut out, thus promoting the growth of young wood which is to bear flowers the following season. But spiræas, lilacs, althæas, and honeysuckles may be trimmed during the winter or early spring, and the branches should be reduced only enough to keep them in good shape. The old growth should be occasionally thinned out, and suckers and root-sprouts removed. The best time, however, for pruning all shrubs is when they have done flowering. The plumed hydrangea should be severely cut back and thinned early in spring. In pruning evergreens, use the knife occasionally to thicken the growth and preserve the shape. This may be done in April or May, just before the trees start to grow.

TRAINING THE QUINCE.

The New York Tribune quotes the method of E. W. Cornell, a successful grower of quinces, from an article in the Dutchess Farmer. We use the whole article, as in no previous number of the Portfolio has this matter been treated:

As the quince is liable to attacks of the borer, I grow it in tree form, thus having but one trunk to keep clear of the enemy; besides, it is more easily kept in proper form and is much more satisfactory every way, trained in the form of a sturdy little tree, with bearing wood throughout all its branches, than the scraggy bush as it is generally grown, with vigorous growth at the extremities, and scantily supplied with bearing wood.

I usually take a good yearling or two-years-old plant, and if it has been grown in bush form with several shoots, I cut out all but the best one, which I choose for the future tree, and also cut this back to within four inches of the ground at the time of planting in the orchard, and from time to time rub off all shoots, which by fall, may attain to a height of five feet and to a diameter of half to three-fourths of an inch, with side branches from the ground up, which I leave on the first year to strengthen the trunk, as each branch upon the stem by the elaboration of the sap through the functions of the leaves, sends down an additional layer of woody fiber, like a bandage around the trunk from its point of connection to the ground, which gives a strong body at the base and tapering toward the top—a very important matter in the forming of a tree, which is generally overlooked.

At the fall pruning I cut back to within two or three feet of the ground for the forming of the top, which should be low to shelter the trunk from the sun, and also shorten the side branches or cut them away entirely, according as the plants be strong or weak. If slender I leave the side branches on until August of the second year, as a short, stout trunk is essential to insure a healthy productive tree. In the spring of the second year I choose three shoots at the top on opposite sides for forming the head, rubbing out all shoots that may start other than these. At the second fall pruning I cut these back one-half their length, and the following spring choose two shoots from opposite sides of the three prongs and one at the top of each for a leader, and at the end of the third year we have the structure or skeleton of a perfect tree, with strong trunk and branching top of nine vigorous arms for the support of the fruit branches.

Hitherto the sole object of the pruning has been for the forming of the tree; hereafter it will be for the purpose of supplying fruit-bearing branches throughout all portions of the tree and the proper maintenance of the same, while increase in its dimensions will be steadily maintained. Luxuriant growth must be kept in check as its energies are now to be applied to the production of fruit. All fruit branches are first wood branches, and all fruit buds are first wood buds, and if left to their natural form of growth the trees may remain unproductive and also assume tendencies to disease; hence the necessity of the pruning about to be described. The slender thong branches that tend to fill up the center of the tree and also to clothe the outer branches are those which, if properly managed, in two or three years will develop fruit buds and produce fruit.

The process consists in stopping the lengthening growth of these shoots by pinching them off during the last of June, when they have attained a length of eight or ten inches. This stops the lengthening growth at the season of the most active circulation of the sap, and the leaves being abundantly supplied with nourishment that otherwise would have been expended in wood growth, now appropriate and elaborate the sap for the developing of the remaining buds, which, from the more favorable conditions, became fruit buds. The terminal buds in shoots so stopped will generally again commence growth for the lengthening of the shoot after a short period, but these being of slower and more feeble growth are generally left to the end of the season, but if they are strong they are again stopped.

At the end of the season it will be necessary to cut back all branches to the point where they were first stopped, and if the topmost shoots and the main side arms that have been allowed full growth for expanding the tree have grown vigorously, they should be cut back one-half in order to maintain a compact, well-proportioned tree, and for the purpose of removing the late, immature growth which with the quince is liable to be injured by freezing, causing blight. This method of pinching in summer and pruning in autumn, if continued two or three years will not fail to produce fruit with any thrifty tree of bearing age, as it provides abundant fruit spurs and checks excessive wood growth. After the trees are well established in bearing, the perfecting of the fruit checks excessive growth, and there is less occasion for pruning.

THE NATURAL WAY.

The Rural Canadian makes some points that may not be wholly in accord with the system of many of our Michigan orchardists, still most of them are well taken, and may set orchardists that are very "artificial" in their methods to thinking.

The fact is, that all the troubles with tree trunks in orchards may be traced to an unnatural mode of culture. Nature has ordered that there shall be a growth of branches on all fruit trees, from quite near the ground, but man has determined that there shall be a bare trunk from six to ten feet in height. On nature's plan, a thick leafy shade is formed around the trunk, and as the eggs of those insects that cause bark troubles are laid by the parents when in the winged state, and they do not incline to fly into the shade, such trees enjoy immunity from these evils, while the bare trunks are fully exposed to them. Nor is this all. The growth of branches low down on the trunk protects from the heat of the sun in summer, and from the severity of the wind in winter, while it keeps the ground moist and cool, so favoring the healthful growth of roots. It is only in the dense forest that trees grow up with high, bare trunks, and there the number of them, and their close proximity to each other, secures the benefits which the tree, growing singly and alone, obtains from the encircling wall of its own leaves and branches. We shall escape a host of orchard troubles when we permit young trees to take their own way of branching out near the ground. The impossibility of plowing close to orchard trees, and the difficulty of gathering the fruit off them, are the only objections of any weight to the natural development which has been described. In regard to the first objection, the answer is the same which was given by a literary man to the remark that his study was too small to swing a cat in. "My dear sir," said he, "I do not want to swing a cat in it." In like manner, we do not want to plow close to fruit trees. It tears the roots, which form a network very near the surface of the ground, and it exposes the trunks to injury by the team and the whippletrees.

In previous portfolios we have shown that the second objection is invalid. Low tops assist in the gathering of the harvest.

THINNING.

A correspondent of the New York Tribune takes this view of thinning fruit In answer to the assumption that inasmuch as all the apples have to be picked anyhow, it will cost no more to thin out when small, and that what are left will measure as much as the whole, and sell for twice or three times as much in the market, he says:

The fact is, all the apples never have to be picked; they are continually dropping from the time of formation from the blossom till maturity, and it is our experience here that the fuller the trees set, the better and fairer the apples. The point is to keep the tree so pruned that there shall be no crowding or shading, and to have hogs and sheep enough in the orchards to pick up the wormy apples as they drop. With peaches and probably some other kinds of fruit, it pays to thin when there is over-fruiting, and there are possibly certain kinds of apples, like the Red Astrachan, for example, with a tendency to cluster, which may be improved by thinning; but to assert that it costs no more to thin when small than to pick at maturity is a mistake that experience would have corrected, for it is a tedious process and not only expensive but requiring skill and judgment.

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To this view Dr. Hoskins, an able pomological writer of Vermont, takes some exception:

The suggestion to thin apples when small I first saw made by J. J. Thomas a number of years ago. I have found it absolutely necessary with most of the varieties we grow here—mainly Russians and Siberian hybrids, with a few of unknown ancestry, but having the same habits. They not only blossom full, but set so full that by the time the fruit is half grown the branches begin to break down. There is comparatively little dropping with these varieties. As to the labor of removing, although there is more fruit, there is of course not half the work of picking after maturity, as they are removed rapidly, and no care is taken in handling what are removed. All of our varieties are of the same habit as the Red Astrachan, which the above correspondent admits ought to be thinned. His suggestion as to sheep and swine in the orchard is good, but only practicable where the trees are branched high. We find it advantageous here to branch low, which also makes thinning easier.

A LESSON FROM A SHARP TRICK.

The New York Tribune tells the story about Forsythe, who was a shrewd Scotchman living contemporary with Thomas Andrew Knight about a hundred years, who was in charge of the Royal Gardens at Kew, near London, in the reign of George III, and managed to create a sensation by showing to distinguished officials from abroad, as well as to others, various trees in which large wounds were handsomely healing over, and attributing the wonderful recuperation to a something which he applied, and of which he held the secret. These taking stories of Forsythe's, who, had he lived in our time and country, would doubtless have been made commissioner of agriculture, were retailed with such additions and estimates as led to a grant of many thousand pounds to him by the government on condition of his making public the ingredients and proper use of the composition for the benefit of mankind. The mixture was nothing but simple loam and cow-droppings beaten together, and its use of course secondary to the clearing out of all decayed parts, and to the stimulus to active growth by culture.

Knight was then president of the royal society, and published articles showing the absurdity of Forsythe's claims, but his good pen was no match for the Scotchman's tongue and red-tape. The incident served however to impress an important fact in tree treatment. In the proper amputation of a branch the cut must be smooth, the bark around must be in healthy condition and carefully saved so that it may cover the wound by gradual extension; and a coating like the air and water-proof basilicon-plaster or salve of the surgeon must be used over the cut as a substitute for the wanting bark or skin. Where this care has been neglected and decay has set in or has proceeded so far as to make cavities in the trunk the dentist's processes must be imitated—all the decayed portion scooped clean out and the hollow plugged with a mixture of loam and cow-dung which should be capped with some waterproof coating.

MULCHING.

The Germantown Telegraph talks sensibly about mulching strawberries for winter protection, when it observes that many persons are induced by what they read to act so as to heartily regret it when the spring comes round. We have known people to act on this suggestion, and cover their strawberry beds with manure, and find the whole completely rotten in the spring. And yet a little covering with the right kind of material is not a bad thing. If the plants are left entirely unprotected the leaves are browned and often destroyed; while it must have been noted by every observant gardener that the best fruit comes from plants that have managed to keep their leaves bright and green till their spring flowers appear. And this is why a covering of snow the whole winter is so good for the strawberry crop. As we have remarked, when the leaves are browned the crop is small; but when the snow covers the plants all the winter long, they come out in the spring in the best possible condition.

But we can not always depend on the snow. It does not always come, or continue in the regular way. So if some light material can be put over the plants that will not smother and rot them, and yet will be just enough to make a shade from the winter sun and a screen from frosty winds, it will be doing a good turn to the strawberry plant. Manure is bad. There is salt in it, especially when fresh, which is destructive to foliage; but clean straw, or swamp or marsh hay that is free from weeds, answers the purpose very well. But it must not be put on very thick. The idea is, just enough to make a thin screen, and yet not enough to hold the moisture long. Shade without damp is the idea. Such light protection is good for the strawberry plant.

MANURING STRAWBERRIES.

A writer in the American Garden, after detailing the inconveniences which result from the use of almost all kinds of stable manure among strawberries, especially naming the germination of weed seeds contained in it as very unpleasant, says: To avoid the annoyance incident to weeds and grass, my own practice has been, during many years passed, to fertilize the ground when strawberry vines are growing, by the application of oil meal and wood ashes spread about the plants and worked into the soil. The growing vines will find all the essential elements of fertility in these substances, both for making strong and vigorous plants and for developing large and beautiful berries. These substances can be applied at any season of the year; and one may distribute a generous sprinkling about every plant without fear of producing weeds or grass, or injuring the growth of the crop by too much manure. Still the better time to apply such fertilizers is late in the autumn, so that all the elements of fertility in the coarse materials may be rendered available before the next growing season.

SOOT.

The American Garden considers soot one of the very best concentrated fertilizers we have for plants, especially those grown in pots, upon which it has a marvelous and almost immediate effect, driving, at the same time all worms from them.

At present it may be difficult to obtain soot in large quantities, but if there were any considerable demand for it the professional chimney sweeps would soon gather and offer it for sale as an article of merchandise. Large quantities are not required, however, and the annual sweepings of the house chimneys and stove-pipes furnish enough for a good-sized window full of plants.

For outdoor use its effect is heightened by mixing it with salt in proportion of one part of soot in bulk to ten parts of salt. Or it may be mixed with any fine compost. The plants should be copiously watered after each application, to wash the soot into the ground and prevent its being blown away by winds.

For pot plants it is best used with water, a handful of soot, stirred well with three gallons of water, in a common watering-can. In watering plants with soot water it is advisable to use small quantities at the time, and more frequently, rather than to charge the soil with more carbon than the plant can readily assimilate.

NATURE'S WAY OF MANURING.

W. L. Curtiss in the New York Tribune says, that with all that man can do he cannot make a soil equal to that received at the hand of nature. What is nature's process? Nature applies all fertilizing things to the surface. Upon the surface fall the rain, the snow, the leaves, and the litter. The excrement of all animal life, and the decay of all vegetable growth, drop and rest upon the surface. To the surface the frosts apply their greatest power and energy, the winds their greatest force; to the surface the sun gives all its resources of light and heat, upon it the atmosphere and its gases rest, and the virtue of shadow, shade, and darkness is there bestowed also. From this notion he gets his method of applying everything on the surface except green clover which he turns under. He thinks well of the practice of hauling crude manure out in winter direct from the stables. The rains, frosts, and snows will take good care of it, but the finer crude or other manure is made the better.

THE COMPOST HEAP.

Mr. W. D. Philbrick of Massachusetts says to those who wish to make the most of their manure for market garden purposes that it pays to have a compost heap; that when barn yard manure is properly composted there is nothing its equal for fertilizing purposes. If this compost heap can be made in a cellar or under a shed and kept moist by liberal watering with liquid manure, a product will result that is hard to beat in fertilizing a garden. The floor upon which the compost is made is best made of cobble-stones or bricks laid in cement or tar and gravel, so as to be water-tight and solid enough to bear a cart; it should have a slight descent toward a cistern which will catch the drainage, which should be provided with a chain pump for raising the same to the top of the compost heap, where it can easily be distributed by means of a gutter with perforated bottom. On wet days all hands on the farm may be profitably employed working over the compost in a shed or cellar and wetting it down with the drainage of the heap, which may be easily replenished with night soil whenever required. The waste from a heap of hot strawy horse dung in the open air in summer is very great—frequently more than half the value—and consists of the most valuable as well as the most volatile of its elements, the ammonia. Gather up all weeds that are going to seed and remove them to the pig-pen or compost heap. If the manure is piled and worked over two or three times before using, it will destroy all or nearly all the noxious seeds.

MANURE FOR PEACH TREES.

A correspondent of Farm and Garden says that most crops seem to have a special fertilizer adapted for them—as plaster for clover, lime and potash for potatoes, and nitrogen and phosphoric acid for wheat. The peach tree has a special fertilizer also, one which combines a great many ingredients, but the most suitable for the purpose. It is the cleanings from the privy. This refuse will show in comparison with anything else that can be tried as it gives quicker growth, increases the fruit and colors the foliage to a deep green. The discovery was made by a New Jersey fruit grower who experimented for the purpose, and the most casual observer could easily discern the difference in the appearance of trees treated in this way from those manured in any other manner.

APPLE EVAPORATORS.

A correspondent of the Husbandman says that the evaporating process is slowly working a revolution in the dried fruit industry, especially with the product of the apple. It renders the dried article so far superior in appearance and quality to that produced by the old methods, that the latter have been nearly driven from the market. Evaporated apples become a staple wherever they are known, and the scope of their market is constantly growing wider.

An increased demand for dried fruit tends to create an increased demand for green fruit, and operates favorably to the business of fruit production. By utilizing the surplus of apples in busy seasons of over-production, the evaporating process helps to equalize and insure the apple market. Large evaporators, located in extensive apple-producing regions, by appropriating vast amounts of fruit that would otherwise be forced upon the market, make room for the product of thousands of orchards which, without this outlet, must inevitably go to waste.

The tendency of this revolution in apple drying is to make the production of apples a reliable business. We think that farmers who have come to the conclusion that apple growing is unprofitable need no longer fear to set out apple trees. In average seasons the fruit will always be in demand; and in years of over production, which have heretofore been a dread, it will command a price that will well repay harvesting.

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We export to Europe annually about 6,000,000 pounds of evaporated apples, but there is no room to doubt that this quantity can be largely increased. An English commercial paper, discussing the subject of American canned goods, says:

There is no country enjoying a fairly temperate climate in which home grown fruit is so scarce and so dear as in England. There can be no question that the demand for dried and preserved fruits is capable of almost indefinite expansion, with larger and more varied supplies, for the supply at present is so inadequate, that some varieties even of leading descriptions can not be had for months at a time, and the trade, indeed, almost comes to a standstill during the summer, not so much because of the supply of green fruit—for that is always very dear in the larger towns—but simply because there is so little dried fruit to sell.

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The American Rural Home announces the formation of a society of fruit evaporators, and comments upon it as follows:

We are very glad this organization has been formed and hope it will be able to accomplish the purposes for which it was instituted. We hailed the invention of evaporators with joy, believing that it opened a cheap and practical way of preserving the surplus products of our orchards, in bearing years, for consumption in non-bearing years, and also that it indicated a means of extending the market of our fruits over the civilized globe. We have been a consumer of evaporated apples for several years, and we have noticed that the quality of what was sold as first-class has gradually deteriorated until we do not purchase now without close examination.

Some evaporators have evidently used fruit that never ought to be used, immature, partially grown fruit, that from worminess or other causes drop through the summer some time before the period of ripening; fruit that would not sell in its green state at all in our markets. Swine and sheep should be allowed to run in the orchard and pick up such fruit as it falls, and it should not be offered to human beings as food or drink in any form whatever. We supposed that the evaporator offered a suitable way of disposing of second class fruits, such as the farmer is tempted to put into the middle of the barrel, full grown but a little wormy, bruised, or slightly specked with rot. In bearing years when fruit is so low as hardly to pay cost of handling, we have thought that it might pay to evaporate good, marketable fruit and hold until a year of scarcity, and thus prevent such large amounts being thrown upon the market to unnecessarily depress it.

We find in market dried fruit not only from such as should never have been dried, but that which was not properly prepared; bits of core, rotten and wormy spots left in, requiring nearly as much labor to prepare it for cooking as it would to prepare the green fruit. All these things are calculated to render evaporated fruit unpopular and hinder its sale, and it is certainly to the interest of honest evaporators to band together and see if they can not devise some means of preventing dishonest ones from ruining a business so full of promise.

KEEPING GRAPES.

The Rural New Yorker says that Mr. Powell has kept Isabella grapes until March without difficulty, preserving the flavor perfectly. They are picked after they are thoroughly ripe, and after the end of the stem next the wood has become ripe, hard, and woody, so as not to bend. They are left in bulk in the open air two or three days to sweat and then put in boxes—a layer of perfect grapes alternating with a layer of good, clean cotton. The lids of the boxes are put on and left partially up. They are then set in a cool, dry room, where an equable temperature is secured. These grapes so kept were late ripened. He had not found the early ripened to keep so well. A member suggested that the success in keeping them was due to the fact that they were perfectly ripe, and that early and perfectly ripened fruit would keep just as well if the same condition of temperature were secured. Another member had found the Isabella to keep well, but he does not succeed well with Concord and Catawba. It was urged that the thick-skinned varieties, other things being equal, kept the best.

EDUCATING THE MARKET.

President Lyon believes we should work toward a higher standard in the quality of market fruits. He is sorry to see societies taking action concerning varieties that is not a look forward, and instances the efficient and time-honored Montgomery county horticultural society of Ohio, which at a recent meeting is reported to have recommended not only the planting of the Wilson strawberry, but also to have coupled with it the Crescent—a variety the very opposite of the Wilson in all the qualities said so strongly to commend that *Arab* among strawberries, to the popular fancy; and one whose only and peculiar recommendations are, that the plant will take care of itself, in spite of neglect or hardship; while the poor, soft, sour fruit is produced in such abundance that, even at diminished prices, it can be profitably crowded upon a reluctant market at a profit.

He says in the Ohio Farmer "that the idea that markets can not be educated is a fallacy, and one that may, to a very considerable extent, be disregarded. This would seem evident from the fact that the present popular demand for the fruits in question (may we not say for all fruits?) has been clearly the result of education. One of our least attractive fruits—the Rhode Island Greening—has, in spite of such fault, come to be almost if not altogether a leading market variety; while the Seckel among pears, in spite of diminutive size and the lack of fine appearance, commands largely increased prices in almost any market so soon as its high quality comes to be known."

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This incident is told of a Maine farmer, which is worth saving.

Five years ago this farmer sold his apple crop to a traveling buyer; he selected and packed the fruit most carefully, and put into each barrel a slip containing his name and address, with a request for a report from the purchaser of their condition when opened and the satisfaction they gave. He had no idea of their destination, but it so happened that the lot went abroad and into the hands of a dealer near Liverpool, who was so much pleased with their quality and condition that he wrote the grower to offer to take his next crop directly; this offer was accepted, and the wise grower has since had a permanent customer. Had he been more sharp than wise he might have succeeded in shoving off a lot of inferior fruit, or he might have "deaconed" each barrel—to use an old New England phrase—by putting the best at the ends; but he would hardly have risked his address, and he certainly would not have heard agreeably from the purchaser.

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Chas. A. Green touches as follows upon a point that has been discussed with us:

No one but the initiated imagines how marvelously beautiful a basket of red-cheeked Crawfords or Fosters may be made by stretching a two-cent strip of gauze or mosquito netting over it. The observer will notice that different colors of gauze are used with different varieties, which he supposes to be merely a matter of chance, but the suiting of the color to the variety is closely and shrewdly followed to the pecuniary advancement of the peach-grower. I saw a man exhibiting some Crawfords at the fair in baskets covered with pink gauze, and his peaches attracted a crowd, while others on exhibition equally large and showy were passed without notice.

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Continuing this same subject of marketing we quote from an address before the Ohio Horticultural Society, by G. F. Newton. He says:

On one occasion I shipped twenty barrels of apples to a customer during the holidays. The weather was mild when I shipped, but fearing it might turn cold I lined each barrel with two thicknesses of paper. They were detained by mismanagement in transit for over two days and nights on the track, and the second day the mercery went down to twelve degrees below zero. There was no fire in the car, but they went through safe. The dealer acknowledged receipt, with draft, and wrote:—"I have been dealing in apples for years, but never knew how to pack apples until I saw this lot." This was my first shipment to him and he has continued to buy of me ever since, when I have any to sell. Some years ago I shipped a few barrels of apples to friends in Eastern Pennsylvania, consigning them to a fruit dealer, who notified the parties the apples were shipped to, and went with the fruit to see how it looked. He immediately sent me an order for fifty barrels, saying:—"I will pay your price for them provided you send me as fine apples as you sent your friends. I never saw apples come out of a barrel in such fine condition. For years I have been buying apples in New York, and I generally get the little ones in the middle of the barrel; yours had the best apples in the middle."

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Geo. A. Cochrane, of England, who has for many years been connected with the fruit trade, fully realizing the difficulty of transporting apples in good order from America to England proposes a remedy. He found that a large portion of the apples shipped to Liverpool came out rotten, although when put on board the steamers they were in sound condition. Some lots he had to sell at from two to three shillings a barrel, while for others he got 18 to 20 shillings. Those stored in the forward part of the vessel generally came out better than those in the after part, because the air forward was generally cooler. But, in order to entirely obviate the difficulty, and preserve the fruit in good condition, he proposes to have the apples packed in boxes similar to egg cases, with perforations to allow the foul air to escape, and stowed in the fore part of the vessel, where plenty of cool, fresh air could be circulated. He would treat apples as living fruits by keeping them in an atmosphere not higher than 35 or 40 degrees, with earth in the bottom of the vessel to attract the foul gas. He experimented with this process, and found it entirely successful.

STORING APPLES.

A farmer near Ft. Wayne, Indiana, writes the Grange Bulletin concerning the storing of apples as follows:

Every season the question is agitated at farmers' clubs and elsewhere in relation to the merits of wet and dry cellars for storing apples. It seems to me that both observation and experience have taught that a warm, dry cellar is one of the worst possible storage places for apples. If apples are to be stored in a cellar at all, let it be a damp one, with means for ventilation. The best place for apples, according to my belief—and this is based on experience—is a cool, well ventilated spot, where the temperature is a uniform one, and just above freezing point. Houses above ground are better, in my opinion, than are cellars for this purpose. I have never had any experience in burying apples in the earth, but incline to the opinion that apples thus kept will be of peculiar flavor, a flavor not altogether pleasant.

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The American Garden makes a good point upon this same subject:

In whatever respects the views of fruit-growers may differ as regards the best methods of keeping apples, all are agreed that apples, in order to keep well, should be picked as soon as their stems separate easily from the tree, *i. e.*, as soon as they are ripe. Every day's delay after that period lessons their keeping qualities. They should also be kept in as cool a place as possible, without actually freezing.

THE VEGETABLE GARDEN.

GOOD SEEDS.

The Marblehead growers start with an ideal cabbage and select those which come nearest to it. They are carefully grown, and by pursuing this course, in a few years they arrive at their ideal. With well-selected seed, in a favorable season, every seed will produce a good head of cabbage. Seeds are too often obtained from the refuse growth, of the farms. Last year one of the best onion growers in Marblehead, not having seed enough of his own raising. bought some of the best seed he could find in Boston. Afterward, the dealer of whom he bought it inquired how it proved, and the grower answered that it would have been better for him to pay twenty dollars a pound for seed like his own than to have such seed as he bought given to him. The dealer, who had honestly intended to sell good seed, went to Marblehead to examine the crop, and acknowledged that the grower was right. The same is true of almost any crop. With good seed you must also cultivate well, but with the best cultivation and manuring, and poor seed, you will get poor crops.

VALUE OF GLASS.

Glass structures are becoming a large factor in vegetable and flower growing even in our State. A writer in the Country Gentleman speaking of this matter says:

When glass becomes as cheap here as in Europe,we may look for a great advance in our gardening. No where is glass so little used, yet so much wanted, as with us. There is continual need of shelter from dry or cold winds, and drenching, chilly rain storms, besides the need in our uncertain springs of anticipating the brief summer by starting plants early under shelter, and giving them protection when newly planted. Besides this, a winter cold frame is one of the most serviceable means of securing greens and salids fresh for early use, as well as for protecting many of the most charming tenants of the flower border, which fail if exposed to every inclemency of a severe winter. The use of hand-glasses and sashes adds to the picturesqueness of a garden. The gardens one sees about French cities are never dull or empty-looking, for they are bright with rows or spots of glass, even when there is little foliage, or nothing of flower or fruit, to be seen. Some half-hardy plants, like forget-me-nots, double daisies, or fragrant violets, may be kept safely in a mere depression covered by a pane of glass.

POTATO NOTES.

The analogies often drawn between the propagation of potatoes and the growing of corn and wheat from seed, are misleading. A potato is not a seed; it is a thickened stem with buds arranged along its side like the buds on the twig of a tree. We can accept facts about potato culture for what they are worth, and many times they are, if rightly interpreted, valuable guides to future methods of culture; but when men theorize upon the good or bad results of planting small potatoes, drawing their conclusions as if the potato were a veritable seed, they are liable to be in error.

A nurseryman who selects a weak stem from which to make cuttings for propagating purposes, would at once be open to severe criticism; and still this is what the farmer does in planting his small potatoes. The florist who would make cuttings from his plants and allow a large number of buds to grow upon each cutting, would be laughed at by others in his profession; still this is exactly the method pursued by the grower who plants whole potatoes.

The potato is a cutting with a good many buds upon it; and while remembering this and the methods of the most experienced propagators of plants by cuttings, any farmer must draw about the following conclusions:

1. Well grown potatoes that are best for market must have the most healthy eyes and the most nourishment to support those eyes when they start to grow.
2. Small potatoes are stems of puny growth, the eyes of which must necessarily be weakly developed, and the amount of nourishment stored for the purpose of feeding the newly started buds is very limited for the purpose.
3. A piece cut from a well developed potato with one or two eyes, must come very near the ideal of a cutting for the propagator of its kind; it will push a strong shoot which will be an index to the root stalks beneath. The tendency will be to produce few stems (or potatoes), but of good size and healthy growth.
4. A small potato planted entire is a cutting with weak buds which will produce many spindling stalks, poorly supported in the outset, and so dwarfed that the tendency beneath is to develop a large number of small root stalks slightly thickened; in other words a large setting of small potatoes.

Prof. Beal says that the leaves of plants are like the stomach of animals. Taking this view, a hill of potatoes with puny stalks will hardly sustain a strong growth of its own system beneath the soil. It is probably true that if in preparing potatoes for seed we should select the small ones and from each tuber cut all the buds away except the one strongest and best developed, we should get very similar results as from planting pieces of large tubers with one eye or bud.

C. W. G

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Granville Cowing, of Muncie, Ind., in a recent number of the Indiana Farmer, makes the following good points upon the potato:

As an article of food for man, it ranks next to the most important cereals. It is impatient of moisture, and in warm weather will be seriously injured or destroyed by submersion for eight or ten hours in running water. Its tubers, if exposed for a considerable time in the sun's rays, become partially poisonous and unfit for food. Paring and soaking such potatoes for a short time in cold water before cooking them will, it is said, remove all traces of the poison and the bitter flavor indicating it.

The potato crop this season is probably the best ever produced in the State of Indiana. Rains came at such short intervals that the Colorado bug and the blister beetle were able to injure the plants but little, and at the close of the season had almost entirely disappeared. By sprinkling Paris green on thin slices of raw potatoes and placing them next spring where potatoes were grown this season, the Colorado bug may be almost entirely destroyed.

I plant potatoes in drills four feet apart, with pieces containing but one eye each, ten inches apart in the drill. A one-horse bar-share plow covers them perfectly by passing once on each side of the drill and throwing the earth to its center.

I recently saw it stated that potatoes kept in a cellar would lose twenty per cent of their weight by evaporation, but would lose nothing in that way if pitted in the open field. That statement, I have no doubt, is true, and will also apply to apples, turnips, beets, etc., and I am also positive that the flavor of potatoes and apples buried in the open ground is much better than when stored in a cellar.

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Enough attention is not given, in the selection of potatoes for planting, the origin of the parent plant. The indiscriminate choice of seed potatoes from the bin or barrel, or from that part of the previous crop left over from the previous year, is not correct in principle nor is it justified by experience.

An unhealthy peach tree may put out a single shoot that looks vigorous; but what nurseryman would think of picking buds from such a branch for the propagation of peach trees? The same kind of care that the intelligent grafter employs in the selection of his cions, or the budder in the choice of his buds, should be exercised by the potato grower in preparing for his crop.

The fact is we are away behind in our average yield of potatoes and ought to do something to ensure better results. The maximum wheat crop is perhaps fifty bushels per acre; the average possibly eighteen bushels per acre. Occasionally we learn of a potato crop at the rate of seven hundred bushels per acre; one-half the average falls below sixty. It will be readily seen by these statistical jottings that we are not living as nearly up to our possibilities in potato culture as in wheat culture. May not the explanation be largely in our neglect about what we plant?

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A correspondent of the Country Gentleman says that boxes are a great convenience and save a good deal of labor. The size we use is 13 by 16 inches, and 13¼ inches deep, all inside measures. The ends are made of three-quarter and sides and bottom of half inch light wood, such as bass or whitewood, planed on both sides. The corners are bound with galvanized hoop iron and hand-holes are in each end. They hold a bushel level full, and it cost me $25 a 100 to get them made at a box factory.

For marketing early in the season, while the skins slip, the potatoes are carefully laid into the boxes, and the boxes put on a spring wagon and covered from the sun. Arriving at the grocer's the potatoes are left in the boxes until sold. In this way they get to the consumer almost as nice and fresh as though dug out of his own garden. We have a spring wagon (box 3 feet by 12), on which we carry forty boxes, twenty in the wagon box and twenty on top. Every box is open to the air, and the potatoes cannot get bruised in the least. Few dealers want a whole load at once early in the season; they prefer to have them fresh every day. By marketing in boxes it is easy to set off a few boxes in a place and to retail a good many single boxes along the road. You will seldom find a grocer who is not pleased to get his potatoes in such nice shape and willing to pay twice what the extra cost is. And then it is a satisfaction to one's self to get an article to market in good condition and to be able to sell quickly, even on a dull market. There is a growing demand for nice things, and we farmers must keep up with the times if we want to make money.

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At our annual fairs, it is rare that the best potatoes get the premiums. Bulk contributes most largely to the award—water in organized cells piled up together in large tubers. This is admitted to be all wrong; but how to right this mistaken method of passing judgment when the judges are usually not skilled in ascertaining the facts which should be the basis of their awards is a fair question. Mr. William Rowe, of Grand Rapids, at the recent meeting of our local horticultural society, made a point that is worth recording.

He advocated a new plan of exhibiting potatoes—that is, new in our country. He said we should do away with showing potatoes in pecks, half-bushels, baskets and barrels, and exhibit them on plates the same as fruit. He would make this distinction in methods, however: Two plates of each variety should be required, one made up of tubers in their natural state, and the other should be a plate of the same variety cooked. He said by this means even the eye could detect fair quality; and if desired the sense of taste could be brought in to assist the judgment.

Mr. Rowe said that in England this method had been practiced for a long time, and at an English show the big potatoes rarely took the blue ribbon.

C. W. G.

SWEET POTATOES.

A Virginian gives his method of growing sweet potatoes, in the New York Tribune, and says that in the same manner they may be grown successfully when one hundred days of tropical weather can be had.

To get plants, make a hot-bed about middle or end of April (at the North) in a warm place; use about one foot of fresh horse-stable manure, on which put about three inches of soil; on that place little sweet potatoes, or large ones cut in two, flat sides down, leaving a little space between each; cover them with about three inches of light soil, then with pine, chaff, or straw, over which lay boards to keep in heat and shed rain. When the shoots break through the soil, uncover, and plant out when all danger of frost is surely over. The sweet potato is one of the tenderest of plants; a chill which would not hurt an Irish potato may be fatal to it or to the potatoes when grown; keep them warm, dry, and ventilated. I find old rich land best for them, say an old garden, though they will grow on manured land. I prepare the land by deep, thorough ploughing, and when just ready to plant, throw two furrows together, making three and a half to four feet rows, and transplant at eighteen inches apart along the top of the rows. After they have all rooted, I go in with a one-horse plough and keep the soil in perpetual motion about them, making sure to give a very thorough working with both plough and hoe after all the vines have began to run. After that the land does the rest of the work, and by September 1st they are fit to eat, and England's Queen has not a vegetable on her table half so delicious.

As to varieties, he says by all means take the Hayman; it is white, firm, and dry, and shaped something like a rutabaga. It has large, round leaves, not notched like the Angola, which it resembles, but excels. The Hayman being early and productive makes good-sized potatoes on rich land in little over one hundred days of tropical weather. The large red sorts are even earlier and more productive, but lack the deliciously delicate flavor of the Hayman. The yellow sorts called Red Noses and Hanovers are raised to ship, but they are late and have a strong taste which people who do not eat sweet potatoes often may endure.

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The Indiana Farmer says that one of its readers has a plan of his own for storing sweet potatoes which has proved entirely successful for the past five years. He piles them in a corner of the cellar, immediately after digging, in as compact a manner as possible, and covers them first with a coating of coarse manure or cut straw, and after this with two or three inches of dust or dirt. He then places boxes or barrels filled with Irish potatoes around the pile and pours a few bushels over them upon the coating of earth. The effect of all this blanketing is to keep the sweet potatoes warm, and at the same time allow the moisture arising from them to escape. During the five years our friend has practiced this simple plan he has never lost a sweet potato by decay. We think it well worth trying, and we intend to test it this winter.

KEEPING ONIONS.

W. W. Tracy, in answer to a question how best to preserve onions, has this to say in the Michigan Farmer: The onions are stored one to two feet deep on the tight floor of some barn or shed (the loft of a barn is frequently fitted up for the purpose), but kept at least two feet from the sides of the building. They are left exposed until chilled or actually frozen, and then covered with about one foot of straw or marsh hay, the space between the wall and the onions being tamped solid. In putting on the hay care is taken not to disturb the onions in the least by stepping on them, but the hay is thrown on from the outside. As the cold increases more covering is added, until by mid-winter it is three or four feet thick and the onions are left severely alone until the approach of spring, when the covering is gradually removed, and the bulbs are are usually found in the best of condition. The object in this method is to have the onions as dry as possible and then to chill or freeze them and keep them frozen until wanted, at the same time protecting them from the warm damp weather of a thaw, and preventing their being moved when frozen. This last is considered very important.

SEA KALE.

The American Agriculturist thinks sea kale will become quite extensively cultivated in this country. It belongs to the same family as the cabbage. Its shoots only are eaten, and that only after being forced to blanch. It is a good deal of work to produce sea kale in perfection, but when properly grown, it is as tender as asparagus and as mild as cauliflower. Our climate is well adapted to its production in abundance, and of the choicest quality.

In regard to its growth that journal goes on to say that it is a perennial plant, and when the bed is once made, it will last for many years. It is propagated from the roots as well as from seed, and where those can be obtained a year's time can be saved. When propagated from the roots of old plants it is usual to cut these into lengths of two or three inches. In early spring place the pieces in a box in the house or in the hot-bed, covering them very lightly with damp moss or light mould. As soon as they start to grow and the weather is suitable, set out in a bed eighteen by thirty-six inches apart. No crop will be produced the first year, but the second year a few shoots can be removed without weakening the plants; the third year they will produce a full crop. The plant needs protection during the winter. A good plan is to cover the bed or plants with leaves, or manure, or leaf-mould. This will protect the plants, and the shoots as they push through this covering will be blanched and ready for use.

SPINACH.

Chas. E. Parnell says, to grow good spinach it is important to give large attention to the preparation of the soil.

In order to produce thick, succulent leaves a rich and deep soil is essential. This can be obtained by either digging or plowing the ground as deeply as possible, and at the same time working in an abundance of well-rotted stable manure. With either the rake or harrow level the ground as neatly as possible. The seeds should be sown in drills from one and a half to two and a half feet apart. The sowing is best done just before a rain, if possible, but unless the ground is absolutely dry a quick germination of the seed can be obtained by proper firming of the soil. This firming may be readily accomplished by pressing down with the feet every inch of soil in the drill.

As soon as the plants become strong enough to handle they require to be well thinned so that they stand about three inches apart. In about two weeks every other plant should be removed so as to leave the plants six inches apart in the row. The ground should be well worked with the hoe and thus kept free from weeds at all times. When cold weather sets in a light covering of straw or salt hay should be given. This covering should be removed about the first of April, a sprinkling of guano applied, and a good hoeing given.

For fall use, spinach should be sown about the tenth of August, and for the winter and early spring crop, from the first to the tenth of September. For the late spring and early summer crop the seed should be sown as early in spring as possible, and if spinach is desired throughout the summer it should be sown every two weeks in order to maintain a succession, but as the summer sowings soon run to seed severe thinning is not necessary. The plants may be permitted to stand three inches apart. For fall sowing he uses the prickly seeded variety, for spring and summer the round-leaved Viroflay.

SHORTENING IN PEA VINES.

Mr. H. J. Seymour, of Madison county, New York, had heard of shortening in pea vines to induce branching and thus increase the crop, and gives his experience the past year to the American Garden which certainly is remarkable. Mr. Seymour writes:

"It was already late in the season, the first blossoms just showing themselves in most cases, yet the experiment was worth trying, and as I had an acre of these peas it could not amount to much if I did injure a few plants. So I counted off six hundred plants on one row, stuck a stake firmly in the ground, and pinched remorselessly an inch or more, blossoms and all, from the top of every one of these plants. Then I counted six hundred plants on the row next to this, and drove a stake without disturbing the plants. I watched the decapitated vines with much interest, and sure enough new branches came out abundantly near the ground and from the axils of the leaves. They finally budded, blossomed, and fruited more abundantly than their neighbors, although about a week later. None of the peas were picked, the entire crop being saved for seed. They were thrashed, winnowed, and carefully measured separately on the 22nd of August, with the following result: The six hundred headed-off plants yielded *five plump quarts*, while the six hundred unpruned ones, in the adjoining row, yielded *four scant quarts*."

MISSOURI MELONS.

Early in the year before our melons are fairly promising in the fields, our markets are flooded with large fine ones from Missouri. We have often wondered about the success of the growers, and recently found in a southern paper the following description of melon growing in Missouri:

The melon district extends from Morley, Scott county, to a point ten miles southwest of Charleston, Mississippi county, and is about twenty-five miles in length by twelve in breadth. Its peculiarity is a light loamy soil, underlaid with a bed of sand, in which water is found at a depth of a few feet. The roots of the vines penetrate the subsoil easily, and draw from it an exhaustless supply of moisture. About 3,000 acres were in cultivation last season, and the shipped product was 1,454 car-loads—about half a crop. The average yield in a good season is a car-load to the acre, the price ranging from $60 to $100 per car load. The crops are sold on the ground to purchasers who visit the district, gather the melons, load them in cars, and make their own arrangements with the railroads. The farmers have nothing to do with this part of the business. The following examples of individual crops are given: F. Ostner, of Diehlstadt, shipped from 130 acres 50 car-loads, which brought him $3,000. The highest price he received for a car-load was $223, and the lowest $22. Average price $60. Henry Misefeld shipped 15 car-loads from 35 acres, which yielded him $1,500. Peter Olson cultivated 50 acres and received for the first 10 car-loads $1,050. Woodley Thomas sold 20 car-loads, from 35 acres, for $1,200. Edward Gipson planted 60 acres and sold his crop for $1,100. It will be admitted that, considering the protracted drouth of last summer, which, it is estimated, cut the crop short one-half, these are very satisfactory results for a work which lasts only about four months, and involves little or no expenditure of money.

RIPENING LATE TOMATOES.

Gen. Noble says, in a communication to the Rural New Yorker, that some years since, through the Gardeners' Monthly, he told how to carry the tomato season two or three months beyond its usual table limit. His plan was the only one then readily available. The fully grown and about all the unripe fruit of any size he picked and placed in an empty hot-bed and covered over with the sash. Boards were first placed in the bottom on the ground and the tomatoes spread over them. In the ordinary course of frosts and freezing weather this would give the table about two months extra taste of the tomato.

This article brought out several other plans which have been adopted by gardeners to stretch the tomato season. One was to pull up the tomato vines and hang them up by their heels in some cool place, bringing them out to ripen in the sun as wanted for the table. Another was to pick them from the vines and put them in some place protected from frost and heat. Another was to place them upon boards in some empty room or attic with a southern outlook, and run out the boards to the sun and withdraw them from the rain or frost, as New England housewives often do with their dried apples.

He does not think the tomato gets much benefit from the plucked-up vines. He thinks, therefore, the best treatment is to pluck the fruit suitable for ripening, and put all except such as may be desired for speedy supply for the table away in a cold place; then place those which you desire to ripen where they will get the benefit of dryness and warmth. As you eat them put others in their place to gladden your board.

Those who have a greenhouse, or any place sheltered with glass where the ripening sunlight can strike, will find little trouble (with trifling protection when the weather is very cold) in having ripe and luscious tomatoes way up to Christmas.

GROWING CELERY.

Mr. Mylius, of Detroit, tells the Gardener's Monthly how he grows celery as follows:

I sow my seed in hot bed on the first of March. The bed must be in good condition, that the seed may germinate quickly, for celery seed takes thirty days generally in open ground to germinate. Seed must not be sown too thickly, as the plants should be stocky. I have tried to germinate the seeds by keeping them moist and warm before the first of March, but I found the above date safest, for if sown earlier there is danger of the celery running to seed. About the fifteenth to the twentieth of May, if the ground is in order and weather suits, plant out in ditches six inches deep on the richest spot you have. The only thing wanted to grow celery successfully is plenty of cow or hog manure and moist land. The soil must be good down to at least twelve inches. About the first of July we commence to bank up, slowly if dry; if moist draw up as high as you can; if really dry weather, so that the soil is too dry to stick if drawn up to the plants, I use foot boards sixteen feet long, pressed on each side against the celery, and sticks driven in to keep in place. This mode bleaches the celery best, but if soil be used the stocks or heads are a great deal heavier. I have kept celery in the following way and kept it till spring, pitted in hot-bed the same as if pitted in the old fashion. After bed is filled the sash are put on; give air once or twice a week; if so cold that boards are not sufficient straw or mats can be put on. Looked after in this way it can be kept till spring.

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A correspondent of the New York Tribune thinks he has struck the way of growing celery, and this is the way he tells about it:

We this year filled our old hot-bed frame, three feet by twelve, with celery plants, setting them about eight inches apart each way, making sixty plants in the frame. It has grown splendidly, and as fast as it grows we fill in with earth, so that it is blanching nicely. I believe that it would have done as well if planted closer, say 100 plants in the frame. The advantage is that it occupies but little space, is not much trouble to cultivate, and requires much less water to moisten it than if planted in the usual way, with the rows six or eight feet apart, besides a much smaller quantity of earth answers for banking it up for bleaching, and of course less labor to do it. If one has not a hot-bed frame he can set boards up at the edges of a bed in the garden, and manage it in the same way. Boards a foot wide should be used, and very cheap refuse lumber will answer for the purpose.

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Mr. C. M. Hovey, of Boston, Massachusetts, thinks that the fact that celery is now produced of better quality than formerly is owing to the modern system of growing the plants on the surface of the ground like other crops and not in deep trenches. In regard to the former, Mr. Hovey says that Mr. Henderson's plan is the only safe one, and is precisely the same he saw practiced when a mere boy, and the one he recommended time and time again, and which he has always followed. The second day of January he had beautiful celery from roots packed away in October, in this manner: A thin light frame was placed upon the ground (on a dry sandy sub-soil), the earth was thrown out two feet or more down to and with some of the sand, which served as a banking for the frame. The roots were then set in, upright in rows, with the coarser foliage cut off, filling in any vacancies between the roots with sand. The frame was then filled with dry leaves and covered with tight shutters. No frost will penetrate such a covering, and there will be no dampness at any time. During the winter roots may be taken out, and the covering replaced.

FLORICULTURE.

SCHOOLS AND FLOWERS.

In urging upon teachers the desirability of growing flowers upon the school ground, we have made this point prominent—that the flowers should be used in the school room, and especially in carrying gladness to the sick rooms of pupils who were deprived of school and out-of-door enjoyments. In many instances reports of teachers have mentioned the satisfaction derived from carrying out this latter idea. In a recent number of the Ladies' Floral Cabinet is an illustration of what good may be done in this way:

Several years ago, when I was a young housekeeper, I was startled one Sunday morning by the request from a working blacksmith for some grapes for his sick wife. We had no greenhouse or vinery. Our little bit of garden was most unassuming, and I could not think what made the man come to me.

However, I told him that I believed a friend of ours had some early grapes, and if I could get some, his wife should have them in the afternoon. My husband walked out with me to our friend's house. Some grapes were most willingly given for the invalid, and some flowers for ourselves.

I gathered two or three pretty and sweet flowers—I remember that a carnation and two sweet peas formed part—tied them together, and we took them with the fruit to the sick woman.

We were taken up to her bedroom. There she lay, pale and emaciated, with an ominous flush on her cheeks. We handed her the longed-for grapes. She said "much obliged."

But when I held out to her the few flowers I had brought, she snatched them so eagerly that I was startled and awed to see the delight they gave to one who was evidently so near the confines of the Unknown.

I called again in a day or two, and saw the flowers carefully preserved and looking bright in a doctor's medicine bottle close by her bedside. That scene taught me a lesson I have never forgotten, and I hope it is not without its use also.

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Marshall P. Wilder says the establishment and adornment of our cemeteries is a strong evidence of improved taste. Where formerly only decaying grass, tangled weeds and moss-covered tablets were generally to be seen, may now be witnessed beautiful sites, natural scenery, and embellished lots, that awaken sensations which no language can describe.

The general use of flowers, from the cradle to the grave, affords striking proofs of a high state of civilization and refinement. Within our own recollection, the use of flowers at funerals or in the sanctuary was deemed improper with the sanctity of divine worship.

These have been too often considered as the mere superfluities of life, but the more we are brought into communion with them, the more will our souls be inspired with gratitude to Him who clothes the fields with floral gems scarcely less brilliant than the glittering host above.

SOWING FLOWER SEEDS.

A writer in Gardening Illustrated, in speaking of the injury which may be done by the heavy watering of small flower seeds before they are up, recommends, in substance, the following treatment: Fill the bed with nearly the required quantity of soil; press it down smooth and level, a firm bottom being necessary; water this soil well with warm water through a fine rose; then fill up with firm, half-dry soil to the required level, pressing gently. Sow the seed and cover it with very finely pulverized compost, giving no more water. Place a sheet of glass now over the seed, and the moisture from below will rise in sufficient quantity, while the surface will be left open and free and in the most favorable condition for the healthy germination of the seeds. Leaf mould answers well on the surface. Do not keep the glass on too closely, and gradually dispense with it by lifting or tilting.

CHEAP AND PERMANENT BOUQUET.

"Horticola," in the Rural New Yorker, is the author of the following capital idea of winter decoration which any one can carry out:

There are a great many people who have no greenhouse from which a dish or stand of flowers may be gathered almost every day in the winter to ornament the parlor or sitting-room, and they may be glad to learn that there are some things that preserve their freshness and beauty for a long time, and cost but little to procure. One of the very best and prettiest of these is the leaf of Cissus discolor, the rich and varied coloring of which surpasses many kinds of flowers. Take an ordinary soup plate (or any similar thing that will hold water) and fill it with water, or, better still, sand kept saturated with water. Now go to some florist's and get leaves enough of Cissus discolor to go round the edge of the plate. Pick out the prettiest colored leaves, and get the leaf stalks as long as possible. Insert the stalks in the sand around the edge of the plate, and you will be delighted with the charming effect. It will not be very long before the leaf stalks emit roots freely, and the leaves will retain their freshness and beauty for a long time in the sitting-room, no matter how hot and dry the air may be, provided only the sand be kept wet. I have kept them fully three months in this way. Having usually plenty of flowers, I keep the center of the dish filled with them, renewing them as they fade. If you have no flowers for this purpose, get same variegated Wandering Jew, (Tradescantia zebrina is good,) and dot it over the dish. It will soon root and grow. Selaginella may be used in the same way for the center, and makes a good green ground in which to insert a rose, a carnation, or other choice flower that may happen along. All this can be done with very little trouble, and will make the center table or even the dinner table, look very cheerful. The rich, velvety leaves of Maranta zebrina, when well grown, will also last a long time in the sitting-room, treated in the same way, but look best in a small vase, or something of that kind.

LOOK AHEAD TO WINTER.

The way to have flowers in winter is to prepare for it in summer. Vick's floral guide has some good points which we condense.

The balsam is a very desirable plant for winter blooming, particularly the white, and towards autumn we often select cuttings from a few of the finest plants in the garden, and root them in pots for winter flowers. The stocks are equally good. The Cobœa scandens, and nearly all the climbers make excellent winter bloomers. We mention these things because they are so easily grown, yet every way desirable. To grow plants for winter flowering, seed can be sown about July or August, in a shady, cool place in the garden, or in boxes, the soil being kept well watered, and by autumn plants will be just right to transfer to the house. Of course, as the plants get large enough to transplant, they must be put in pots in which they are to flower. Mignonette and sweet alyssum may be sown as late as September. Put from three to six plants in a pot. The Maderia vine tubers may be kept out of the ground until the latter part of June; and if then planted in pots will be in just proper condition to transfer to the house, and will prove no mean ornament to the window garden.

The tuberose should be treated in just the same manner, and will flower in the early winter.

Any plants in the open ground that have not bloomed, may be taken up carefully and potted, shading a few days after potting, and given a full supply of water.

Look around the garden before frost, and see if you have some young and strong plants that proved a little late for out-door flowering, that you would like to grow in pots. If so, take them up with as little disturbance as possible, put in good soil, and treat as previously directed.

HOT WATER FOR PLANTS.

Mrs. C. W. Garfield uses a great deal of hot water upon her window plants; says it is good in sickness or in health, and while discussing the absurdity of the notion we were politely handed an article from a correspondent of a French horticultural journal.

He says when ill-health ensues from acid substances contained or generated in the soil, and this is absorbed by the roots, it acts as a poison. The small roots wither and cease their action, consequently the upper and younger shoots of the plant turn yellow, and the spots with which the leaves are covered indicate their morbid state. In such cases the usual remedy is to transplant into fresh soil, clean the pots carefully, secure good drainage, and often with the best results. But the experience of several years has proved, with him, the unfailing efficacy of the simpler treatment, which consists in watering abundantly with hot water at a temperature of about 145° F., having previously stirred the soil of the pots so far as might be done without injury to the root. Water is then given until it runs freely from the pots.

In his experiments the water first came out clear; afterwards it was sensibly tinged with brown, and gave an appreciable acid reaction. After this thorough washing, the pots were kept warm; very soon the plants began growing vigorously.

RESTORING FROZEN PLANTS.

The Boston Cultivator tells how to restore frozen plants, and claims that its method, if strictly followed, will never fail:

Allow the plants to remain where they were frozen; darken the room as completely as practicable, and sprinkle them with cold water direct from the cistern. A few drops of camphor put into the water will render it all the better. Do not allow the room to become warmer than forty-seven degrees for twenty-four hours. Although the water may freeze in drops on the leaves when sprinkled, the plants will come out unharmed if this treatment is strictly adhered to.

FLOWERS BY MAIL.

The Fruit Recorder tells how to send flowers safely by mail:

A cardboard box about seven inches long by four and a half broad, such as shopkeepers have for crochet cotton, is the convenient size; and though at first sight it may appear too small to contain more than a dozen blooms, it is wonderful how much can be put in with judicious packing. In the bottom of the box lay a little slightly damp moss, then a layer of flowers and a few green leaves, another layer of flowers and then finish with an upper stratum of moss. Pansies and lillies of the valley travel well, and will come out as fresh after a twenty-four hours' journey, and in most as good a condition as when first packed. If a difficulty occurs as to the length, the stalk should always be cut, as the bloom will not stand bending. Geranium blooms are too lightly set in the calyx to bear a journey, but primroses, violets, anemonies, sweet peas and verbenas, tulips, mignonette, rose buds and forget-me-nots, are all treasures to use for this purpose. After unpacking a box of flowers, place the tips of their stalks in boiling water, let them remain for about five minutes, remove them, cut off a tip from each stalk, and put in clear, cold water. Treated in this way, the most faded flowers will generally revive.

CARNATIONS.

Mr. Thomas Brown, near Grand Rapids, has wonderful success in growing carnations. His house at this writing (January, 1883) is one mass of bud and bloom. He says that his success is largely due to not following the oft repeated idea that carnations must be kept in a cool atmosphere to be healthy and productive of flowers. Several times when we have visited his carnation houses the temperature has been almost tropical. It is no theory with him. He practices this method because he succeeds in it. On the other hand "Croppie," in the New York Tribune, says:

During winter carnations are is very partial to a cool atmosphere and very little water, merely sufficient to keep them from being entirely dry, and on mild days give fresh air freely. They delight in moisture on the foliage, which may be applied with a "rubber spray," which forces the water out in minute streams almost in the form of vapor. Tie up the long shoots as they grow to slender stakes, else they will be liable to break.

WINTERING GERANIUMS.

A good many suggestions are made as to the best way to keep geraniums in winter. We have recorded some of them; however the following is new to our Portfolio and is furnished by the Country Gentleman:

A rather large and well lighted window in a cool cellar is double glazed and a stand is provided on which the plants are placed so as to receive plenty of light. When they are taken up in autumn nearly all the tops are pruned off, but enough is left for the base of a compact form, with a small portion of the young foliage, say about one-tenth or one-twentieth of the leaves of each plant. They are then planted in moss in a shallow box, placing the box in an inclined position or with a slope of about forty-five degrees, putting a layer of moss on the lower side, then a row of the trimmed plants and another layer of moss and row of plants till the box is filled. It is then placed in its position on the stand in front of the window. The moss may be kept sufficiently moist by showering it with a watering-pot once a month or a fortnight, as it may require, a warm and dry cellar needing more frequent watering than a damp or cool one. In a warm cellar the plants will make some growth during winter, and as the leaves increase in number they will consume more moisture than at first. If the cellar is quite cool they will remain nearly dormant and the slight moisture from the moss will preserve them from drying up. Moss is much better than damp sawdust, which in its turn is better than soil. In moss there is no danger of their becoming water-soaked after watering, the natural supply being given off partly in the form of vapor. The most convenient size for the boxes is about two feet square and six or eight inches deep, but they may be larger or smaller. An early growth is made the next spring by putting them in a hot-bed for a few weeks before planting in open ground. A small portion of a hot-bed will hold a large number placed compactly together.

PANSIES

W. H. White, in the Country Gentleman, says:

To obtain choice, large blossoms, pansies require very rich soil in a somewhat sheltered location. A bed which has been used as a hot-bed the previous season and left over makes an excellent place for them. Either of the following methods of growing plants will be found successful: Sow the seeds in a box of rich soil about the first of April, and set it in a south sunny window. About the middle of May transplant them into the bed where they are to blossom. Another way is to sow the seeds in a bed, where they are to blossom, about the first of September, and on the approach of freezing weather cover the bed with strawy manure. Or they may be sowed in any bed of good soil and treated in the same manner. They will come out fresh and strong in the spring and can be left to grow, or may be transplanted to any desired location. Good seed, rich soil, and good care bring fine blossoms.

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P. E. Cope, in American Garden, gives a little more specific directions as to soil:

My mode of treatment consisted in placing an old hot-bed frame in a shady place. Then I mixed well one part of old cow manure and one part of common sand (the washings of the roadside) with two parts of good loam, and filled in the frame, levelling the surface with a layer of the same sifted compost. The seed was then sown thinly, covered about one-third of an inch deep, and pressed down firmly with a board. It sprouted quickly and made a fine growth. As soon as the plants were large enough for handling I pricked them out in another frame filled with the same compost. Here they were left during winter. They wintered well, and in spring I planted them out in rows in a bed which was composed of the same mixture used in the frames. The proper composition of the soil is of great importance, and is, I think, the main point in growing pansies. About the middle of July I cut the tops off and shaded them a little for a few weeks, and all through autumn they were magnificent.

ENGLISH IVY.

Neltnor's magazine speaks in high praise of the English ivy for drawing room decoration. The following directions are given for the management of ivy plants:

Being very strong they will live through almost any treatment; but study their peculiarities, and manifest a willingness to gratify them, and they will grow without stint. Most houses are too hot for them, as indeed they are for their owners. Neither plants nor people should have the average temperature over sixty-five degrees Fahrenheit. Take care and not enfeeble your ivies by undue heat or excessive watering, and you will find that they will not seem to mind whether the sun shines or not, or in what position or direction you train them. Indeed, so much will they do of themselves to render a room charming, that I would rather have an unlimited number of them to draw upon, than anything else in nature or art. Do you wish the ugly plain doors that shut off your tiny entry from your parlor were arched or curved like those in the drawing-room of your rich neighbor? Buy a couple of brackets, such as lamps for the burning of kerosene are sometimes placed in, and screw them on the sides of the door. Put in each a plant of English ivy, the longer the better, then train the plants over top, against the sides—indeed, any way your fancy dictates. You need not buy the beautiful but costly pots the flower dealer will advise; common glazed ones will answer every purpose, for by placing in each two or three sprays of Coliseum ivy, in a month's time no vestige of the pot itself can be discerned through their thick screen.

THE CARDINAL FLOWER.

The spikes of the Cardinal Flower found in low woods all over Michigan are strikingly beautiful, but are rarely found in cultivation, although the plants are easily grown in the garden. The American Garden in speaking of this plant says: We find it advertised in some seed catalogues, among the novelties of the season. This is a move in the right direction, and this brilliant and gorgeous flower which has been growing wild in our meadows and along our brooks ever since man first set foot on our soil, and no one knows how many millions of years before, is probably a novelty to many who have lived a lifetime within a short walk of its native habitat. We search the wide world over for "novelties," while here they are growing around us in splendor and brilliancy. Nothing more dazzlingly beautiful can be imagined than a bed of Cardinal Flowers in autumn, when in full bloom, grouped in a shady spot on a smooth, velvety lawn with a group of Cannas or Rhododendrons as a background.

THE WHITE ALYSSUM.

In selecting plants for the window garden, be sure to obtain a plant or two of the Double White Alyssum. It is similar in every way to the well-known Sweet Alyssum, but possesses the desirable quality of having double flowers, and thus remaining in blossom for a much longer period. As a plant for the flower-border, it is indispensable, and it is valuable for cut flowers at all seasons of the year. Propagation is effected by cuttings, which should be taken from those plants that produce the most perfect double flowers.—[*Rural New Yorker.*

ARBORICULTURE AND FORESTRY.

THE WHOLESALE DESTRUCTION OF TREES.

We most heartily endorse the sentiment of N. H. Eggleston, in Harper's Monthly concerning the wholesale destruction of trees and make the following quotation from the article to open this section of the portfolio:

The trees are man's best friends, but man has treated them as his worst enemies. The history of our race may be said to be the history of warfare upon the tree world. But while man has seemed to be the victor, his victories have brought upon him inevitable disasters.

In the more civilized periods and places the poetic sentiment has found sweet companionship in the trees, and peopled the groves with dryads and hamadryads, while taste and refinement have planted them near the household dwelling-place, and found pleasure in their beauty and shade. The general feeling and course of action, however, have been in an opposite direction. The trees have not only been regarded by man as his lawful plunder, but he has even seemed to have a positive pleasure in their destruction. He has attached no value to them, except for the satisfaction of his physical wants, to furnish him fuel and shelter and the material of the industrial arts, and in satisfying these wants as they have arisen he has been reckless of the future. The supply has seemed to be abundant, and the future has been left to take care of itself.

In our own country we have gone to the forests in a kind of freebooter style, cutting, and burning more than we could cut, acting for the most part as though all the while in a frolic or fight, until now at length, after a century or two of this kind of work, we are waking up to the facts that our once boundless woods are disappearing, and that we are likely to suffer no little loss thereby. But it is only the few who seem to have any adequate sense of our condition as affected by the threatened loss of the trees.

A POCKET ARGUMENT.

Mr. C. M. Hovey in the Massachusetts Ploughman, suggests a method by which some practical work in forestry can be done by the State, he asks:

Why not rely in this important matter upon individual effort? Why not appeal to every owner of waste lands throughout the State to plant them with forest trees, under the inducement of exemption from taxation, or at least without additional tax for every acre planted, whether one or five hundred? Every farmer or owner would soon become deeply interested, and have some inducement to seek for information which would enable him to learn its importance and aid him to succeed in his effort, provided he was not already familiar with the work. It would entirely change the state of things as they now exist, and which quite discourage all improvements of the kind. Farmers who would naturally plant trees, are deterred from doing so, knowing that their taxes will be increased just in proportion to the acreage planted. Thousands of acres of waste lands are taxed at a very nominal rate, but the moment any attempt is made to improve them, to plow or plant, the rate is at once increased, though no apparent value is given to it, at least for a great many years, as the care and labor of planting and rearing the young seedlings is much more than their immediate worth.

WHERE TO PLANT THE CHESTNUT.

This practical note is from B. F. J., in the Country Gentleman:

I sometimes think we do not sufficiently respect the physiological and other peculiarities of trees, shrubs, and vines, when we choose them for this, that, or the other soil and situation. Just now there appears to be a boom got up for the benefit of the native chestnut. It is claimed it will do well in almost any soil and section and that no one can go far wrong in planting it where trees are wanted for shade, shelter, or ornament. But the fact is, the chestnut of all our valuable forest trees is particular about the land it grows on. On the rich loams of the west most of which are underlaid by a compact and calcareous blue clay, where the burr oak, the walnut, the blue ash, the sugar maple, and many other valuable timber trees do exceptionally well and attain gigantic proportions, the chestnut infallibly dies within ten or fifteen years after planting. But on gravelly or sandy soil, or where beneath a rich loom there is a deposit of porous sand or gravel, the chestnut may be safely planted. If an endorsement of these statements is needed let me quote the *Bon Jardinier* which says, "The chestnut grows with vigor in silicious sands where it lives many centuries and attains remarkable proportions, but it inevitably perishes in calcareous soils and subsoils."

NATIVE FORESTS.

In the Post and Tribune we find the following:

While there is much said and written in regard to forest tree cultivation, we find very little attention paid to the preservation of native forests. In the timbered sections we have been too busy trying to get rid of the timber, to think of any method of preservation. Yet in some sections that were formerly timbered there is now felt to be a scarcity of timber, particularly of that kind which is useful in manufactures. The only remedy mentioned is the planting of forest trees for this purpose. But this is a work that we are hardly prepared for in this State and it is probable that only necessity will compel artificial planting. The time seems too long to wait for an investment of this kind to begin to pay, and there are very few who will undertake the work. At least very little has been done in this line. At the Agricultural College an experimental arboretum of four acres has been growing a few years; and a farmer in Monroe county has this year set 1,500 black walnut trees with a view to grow them for timber.

Would it not be well to study more closely the possibility of improving the timber lands that still remain. The woods still standing contain a vast amount of material which is susceptible of development in far less time than would be required for the planting and growth of new forests, the neglect of which furnishes a striking proof of the general ignorance of forest culture. The timber is ruthlessly cut from many places that are nearly useless for cultivation after, and would be worth far more for growing timber than for any other purpose, more beautiful to the eye, and more profitable. In many instances the native woods have been so much neglected or so injured as to be past redemption, yet there are still large areas of forest and smaller groves and wood-lots now yielding no revenue which might be developed into timber forests of very great value and at the same time yield an annual crop of fire-wood in the process.

Cut out the dead and least valued timber for firewood, preserve the small growing trees that are of the best varieties for timber. It will be necessary for the best care of the forest to keep stock from running in it as they will totally destroy all small growth. In almost every tract of woodland may be found more or less of trees of the best varieties for timber mingled with a great variety that are worthless or only fit for fuel. In many cases they have been neglected and cannot be improved, but in most cases intelligent work in thinning and pruning will be followed by profitable results.

FORESTRY IN IOWA.

Prof. C. E. Bessey, of the Iowa Agricultural College, in a private letter says of forestry in that institution:

I write this note upon the campus of the college, which fifteen years ago was a rolling prairie, entirely destitute of trees or shrubs; now there is all over our grounds a fine growth of forest trees, many exceeding twenty or thirty-five feet in height. In several parts of our grounds there are heavy masses of young forests, in which already forest conditions are beginning to appear. Forest grasses and mosses are beginning to show themselves, and forest birds have, for several years, taken full possession of the trees. The elements of forestry are taught in our college course of study, and the young men are given practical training in the planting and care of trees.

A KANSAS FORESTRY IDEA.

The following is from an address by President T. C. Henry of the Kansas Horticultural Society, which we clip from the Industrialist. Mr. Henry may not be right but a great deal of sentimental nonsense has been uttered on the other side of the question and it is refreshing to have some one knock out the underpinning of the sensational addresses that come so cheap and are so gauzy in argument. Mr. Henry says:

Mahomet was mistaken in saying "The tree is father to the rain," and so are all after him. Tree planting will no more renovate a desert than agriculture will overcome the aridity of the plains. It is a fact, modified to some extent by local circumstances and conditions, that rains produce forests, and where naturally there are no forests man can never successfully plant and maintain them. Hence the importance of "Kansas" forestry as one of the greatest demands of our climate ought not to be urged.

While in New Mexico recently, from the Hon. Trinidad Romero, ex-delegate to Congress, and a gentleman of unusual intelligence, I learned that the records preserved in his family reaching back to the Spanish settlement of that territory—more than two hundred and fifty years ago—show indisputably that its forestry, rainfall, and general climatic features are unchanged. Also while in Mexico I was informed by Governor Tarasses of Chihuahua, that the same has been true of his country since its earliest historical times, but that there appears to be periods, ranging from twenty-five to fifty years, in which the character of the seasons, as to moisture, temperature, etc., has fluctuated between the limits of certain extremes. It is true tree culture there has been almost wholly confined to the gardens of the Jesuit fathers, and along the banks of the Acequias, and sustained by irrigation. But the fact that large areas had been irrigated and agriculture maintained for centuries, should have produced by this time at least some discernible modifying climatic results. On the contrary these elevated plateaus, lying between parallel mountain ranges in interior Mexico, present fixed climatic conditions, and no human endeavor will ever change them. The mountain chains bordering those plateaus and nearest the coast lines—the Pacific particularly—arrest the moist wind currents and are abundantly supplied with rain and snow. Hence it happens that those mountains are clad with natural forests, and agriculture among their foot-hills and along their base is such as normal and sufficient rainfall supports. The flora, too, of all those vast arid sections, presents incontrovertible evidence on this point, and is, of course, far more valuable and convincing than any merely traditional or historical testimony.

TREE PLANTING BY RAILROAD COMPANIES.

The following is a brief abstract of a paper read by Dr. Franklin B. Hough, of Lowville, N. Y., before the American Forestry Congress:

We have now about 100,000 miles of railroads in the United States. Allowing nothing for increase, but making estimates on the present lines, in the matter of ties, the figures would run something as follows: The number of ties per mile ranges from 2,200 to 3,000, and in some cases as high as 3,500. If we assume that they average 2,500 to the mile, we have a quarter of a billion in use. They average eight feet in length, and about seven inches deep and eight wide, giving the contents about three cubic feet apiece, or in all six millions of cords. If piled cord fashion, they would form a pile four feet high, eight feet wide and 4,575 miles long. Placed end to end they would span the earth fifteen times at the equator, or in one line would reach miles beyond the moon. We may take their average life at from five to eight years, and we shall need from 30,000,000 to 50,000,000 new ties a year for maintaining the present railroads of the country in constant use.

The number of ties that can be cut from an acre of wood land varies exceedingly, but, at 500 to the acre, we shall need to cut over from 60,000 to 100,000 acres every year, to meet this demand.

It probably is not out of the way to say that trees will grow from seed to size sufficient for ties in thirty years; then we shall need from nearly two millions to over three millions of acres, or from 3,126 to 4,687 square miles of forest to keep up this supply.

At the rates we have assumed, there should be from eighteen to thirty acres of woodland for every mile of single track road. Taking twenty-five as a safe average, it follows that there should be somewhere about 2,500 acres in forest for the maintenance of every hundred miles of track. This is equivalent to a belt of woodland 12½ rods wide along the road, or about three times the width of the right of way.

On account of protection from cattle and fire, it were better that the plantations be in parcels. We assume that land for this use can be bought for $20 an acre, and at this rate it will need the investment of $500 in land for every mile of track to maintain a perpetual supply of ties for its use. This is the fixed capital in land, without including the cost of planting and management, nor of cutting and delivery. It would undoubtedly be a wise and proper investment of money on the part of railroad companies, by thus rendering themselves independent for the supply of a material as necessary for their use as iron itself. There will arise, and perhaps may now be found, a class of men who would undertake by contract the planting and care of such woodlands, and this would doubtless prove the most economical mode of management.

There are other important motives for planting by railroads that we may next notice. The consolidation of embankments, and the fastening of the soil upon slopes that overhang the track, can be done in no way so effectually as by the roots of trees and bushes, and for this use those that have tracing roots, and that are continually sending up sprouts at a distance from the parent tree acquire great value, while they could scarcely be tolerated near cultivated grounds. The erosion of banks by streams can best be corrected by the planting of alders and willows, and the ravines that are so sure to form in light soils, upon steep banks, from rains, are effectually prevented, even by a dense growth of bushes, but better by forest trees.

There are other cases in which judicious planting may prove of inestimable advantage, as well to railroads as to common highways, in preventing drifting snows. In our Northern States and in Canada this becomes in winter a matter of great anxiety to the traveler, and often of vast expense to railroad companies. It may in every instance be alleviated or wholly prevented by judicious planting, especially on the side of the prevailing winds. A single row of deciduous trees will scarcely produce any effect; there should be at least half-a-dozen rows, and in the more exposed places twice this number, set as closely as may be conveniently grown, to secure full immunity for this cause. A double row of evergreens will generally serve the purpose, but it would still be well in a bleak exposure to have a narrow belt of woodland on the outside to break the force of the storm, and protect the plantation from injury.

So important has this subject been proved to be, that the Northern Pacific Railroad in Minnesota and Dakota has undertaken to protect its line at all the cuttings and exposed places for the whole of the distance or as far as it is possible to make trees survive, and with the view of continuing these plantations at places where it is less necessary for the general benefits to be derived from their presence.

Several other railroad companies in the northern and western States have given attention to planting, in some cases for shelter against drifting snows, and in others for the encouragement of settlement, by proving the capacity of the country for the growth of forest trees, in treeless regions on the prairies and the plains.

ECONOMICAL TIMBER PLANTING.

In any business there is a good point gained when time and labor are so adjusted that nothing is lost. This is very true in tree planting on a large scale. What might be accomplished by the proper management of help for a dollar, often under mismanagement costs five dollars. Robert Douglass, of Waukegan, Ill., knows how to plant trees economically, and this is how he talks about it:

The land is prepared as for corn, rolled and marked 4 by 4 feet with a corn marker. The trees are heeled in at convenient distances around the land to be planted, or in some cases distributed in boxes; a wagon follows the planters so that a bundle of trees can be handed to each tree holder at any moment.

Our men work in companies of three each, two with spades and one holding and placing the tree; the two men taking each a row, the tree holder stands between the two rows; the tree should be placed as near the point where the marks cross each other as possible; to accomplish this the planter first strikes his spade down vertically on the mark close up to and beyond the angle; he then takes up a spadeful of earth so as to leave two straight sides to the angle; while he is raising the spadeful of earth the man (or boy) holding the trees inserts one; the planter drops the spadeful of earth, places his foot firmly close up to the tree and steps forward to the next mark. In this way there is not a motion lost; the first stroke of the spade is needed to allow the spadeful of earth to come up clean from the corner, and it is done in an instant, for the man naturally carries his spade in the left hand, and when he takes his step forward he simply strikes the spade down on the mark with its face to the right, draws it out, and places it directly on the cross line close up to the corner, raises up the spadeful of earth and drops it down again, covering the tree, for by the time he has the spade raised as high as his knee the tree will have been inserted.

An active, quick-motioned boy is as good as a man to hold the trees; he can attend to two men, but it keeps him busy. The trees are tied in bundles of fifty to one hundred, according to size. After a little practice he will be able to bring the tree to its place by an upward curving motion that will spread out the roots as well as they could be spread out with the fingers.

The best of spadesmen differ somewhat in their modes of operation; some of them in taking out the spadeful of earth incline the spade a little to the right in raising it to give room for the tree to be placed, and never having the spadeful raised higher than the knee; others raise it as high or higher than the waist and bring it down with great force, throwing it from the spade into the hole, so that it packs the tree quite solidly. You must understand that the earth is not inverted as in spading, but placed back exactly as it stood before, and when it is well done, and the earth is in good condition, it looks as if the ground had not been disturbed at all.

By this mode of planting we average 1,500 trees planted for every man and boy employed in a day of ten hours, 4,500 to a gang of three. Of course, larger trees where one spadeful of earth will not make a deep enough cavity to hold the roots will take longer.

VANDALISM WITHIN THE LAW.

Wm. Robb, of Montreal, made some very pertinent remarks before the American Forestry Congress which apply in almost every town in these days of telegraph and telephone communication. He said that the chief transgressors upon our pet shade and ornamental roadside trees are the telegraphic companies of the land, who hack and mutilate the trees along their lines with profound disregard of their habits or requirements.

You may possess a row of trees which you regard with pride and affection, which have taken many years to arrive at perfection, and which charm every eye that sees them, but the inevitable telegraph arrives, and some fine morning you wake up to find them mutilated beyond recognition and the road strewed with their debris.

In the excitement of the moment you rush for your gun, a club, scythe, anything calculated to inflict punishment commensurate with the enormity of the offense, but they have gone, fled like a plague of locusts to continue their work of destruction on some neighboring victim.

But, though they have escaped summary vengeance, you feel that the measure of their iniquity is full and you resolve to follow them with the bloodhounds of law. But, standing at the threshold of telegraphic legislation you find privileges granted, under which they might commit almost any depredation.

No doubt it is necessary that power should be given to carry out their charters, but all privileges granted to an individual or class are limited by the rights of all other individuals. Yet here is a power given which inflicts enormous injury on every one subjected to its operation.

Neither the Legislature when it granted, nor the companies when they asked for such privileges, could have anticipated for one moment the injury they would inflict on others, but now that the result is appparent it ought to be remedied.

Single trees, which money would not tempt the owners to part with, have been ruined by them; what then must be the aggregate of damage inflicted upon the whole country. The very least they could do would be to employ only such men as were familiar with arboriculture and permit no cutting to be done which was inconsistent with its principles.

ROADSIDE PLANTING.

From an exhaustive article on highway planting in Vick's Magazine we cull the following:

The best results in planting street trees are attainable when there is concert of action by the entire community in relation to the subject. Such concerted action indicates considerable advancement, or a general spread of horticultural taste, and, naturally, the best examples of it, might be expected to be found in the oldest parts of the country. But the migratory character of our people greatly modifies the formative conditions of society. The most enterprising and well informed persons are often leaders in new communities, and exercise great influence in shaping their features; so, in some of the new towns and villages of the west, there are found handsome, broad streets and avenues lined with trees, and public squares and parks, while many of the older villages are yet as deplorably destitute in these respects as at their beginning.

During the summer season, with heat almost tropical, the shade of trees in passing along the street is gratefully appreciated. What are the best trees for street planting, and what the best modes of planting, are questions of general interest.

To say that street trees ought to be planted in the street may seem a superfluous statement; nevertheless, many a place would be the better if this simple rule had been observed. Formerly it was more customary than now to plant a row of trees along the fronts of lots, within a foot or two of the street line. The advantage of thus placing trees is apparent, since they were there protected by good fences, and were thus secure against injury from horses and cattle. This security it is far better to obtain by proper guards to the trees when necessary; but, fortunately, in most localities, the necessity of protection no longer exists. The row of trees across the front renders it almost, if not quite, impossible to plant the grounds with any effect in the modern style. The trees intended for shade of the sidewalk should, therefore, be always planted along its outer edge and next to the roadway.

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A correspondent in the Ohio Farmer gives a bit of experience upon the same topic:

Our farm lies on both sides of the road, about 30 rods in all fronting on highway. We have improved the land and set out maples the whole length. We employed a surveyor and found the center of the road; then set trees on line on one side (30 feet from center), and on the other side six feet *in* from line. The result was, everybody traveled on the side of the road next the trees set in 6 feet. We soon saw that these trees would amount to nothing, and we took them up and set them on the line. We now have a nice piece of road.

Brother farmers, when driving along the road and you see a nice space on one side that you think would be easier on your team, just think, before crossing the ditch, whether you would like any one do the same on your land. Put the golden rule into practice, and you will feel better after passing that man's land.

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President Lyon believes that important advantages are to be anticipated from the silent influence of our law concerning highway planting; mainly for the reason that it places before the tax-paying land-owner a clear pecuniary motive for the consideration of the subject, and for his proposed practice under it. The farmer and land holder doubtless comprises in his make-up fully his proper proportion of that very doubtful material usually designated *human nature*, one of the most constant, perhaps we may say universal, qualities of which, is a decided sensitiveness in the region usually known as "the pocket," manifesting itself in a repulsion of the proposition to draw from it even the smallest sum, and an equal readiness to accept a consideration offered, whether great or small.

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W. I. Chamberlain, secretary of the Ohio board of agriculture, has written a good deal about roadside planting, and here is his opinion in a nutshell:

A close line of trees, especially of elms, fully shading and overarching the road tends to keep it muddy and bad, but if maples are planted at 33 feet apart on clayey soil, or 40 feet apart on rich, sandy loam, they will not form a connected, compact shade, or greatly injure the highway or adjacent land. And yet they will greatly relieve the landscape and furnish a grateful shade, and when grown they may be tapped in connection with the sugar camp. Our public sentiment I think ought to encourage a man or a neighborhood that is trying to grow a nice row of trees and a nice, straight strip of green turf along the streets. Each man objects to having his neighbors drive on the grass in front of his house. Each man seems to forget it when he goes away from home. My ideal of a country road is that it be properly turnpiked and graveled, with a nice row of maples (not too close to each other) on each side, and a strip of turf straight on the ditch edge, and mowed by the owner twice a year for the sake of looks and of hay. The hay would pay for the work, and the beautiful effect would be worth the while.

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A correspondent of the New York Tribune gives the following note on street trees:

What are the best trees to plant along roadside and pavement curb is a much mooted question that I have been trying to answer to myself for several years, and I venture to record the result of my experience up to the present time. There are five requirements: Hardiness, rapid growth, attractive appearance, umbrageousness, and adaptation. If for the crowded city with its gas and smoke, as well as the uncongenial soil where it is expected to thrive, and the roots covered too with a pavement, then we must be very careful in our selection, as the list of available species is small indeed. But in the suburban town our list of available trees may be greatly enlarged, and for new avenues, broad and open, or for the country roadside we have little trouble in deciding. As at present advised I would suggest: For dense cities in narrow streets, I know of nothing to excel the the so-called "Carolina" poplar, with its large, dark green foliage, rapid growth, and hardy character, apparently succeeding where most other species assuredly fail. Next, for the rural town, I prefer decidedly the well known sugar maple, notwithstanding it is not of such rapid growth as some others. But it possesses so many valuable properties that it must take preference. Lastly, for the country roadside, I prefer the American linden, with its very rapid growth, umbrageous foliage, hardiness, and adaptability to the purpose.

THE RUSSIAN MULBERRY.

Mr. D. C. Burson, of Topeka, Kansas, believes in the Russian mulberry, and if all he claims for it be true, and it is hardy with us in every respect, it is as good for Michigan as for the prairies of the West. He says it is a rapid grower and stands transplanting almost equal to the cotton wood, but its great superiority over the cotton wood is that its timber is valuable, the tree ornamental, and the fruit useful. The timber is used in the manufacturing of cabinet-ware, and for durability as a fence post it is not surpassed even by the catalpa or red cedar. It commences bearing at two years old, and is very productive. The fruit, which is about the size of blackberries, has a sub-acid, sweet taste, and is used for dessert; it also makes a pleasant light wine, and the leaves are largely used for silk worm food. As to the rapidity of its growth, trees, the seeds of which were planted seven years ago, are now 25 feet in height, and from six to eight inches in diameter. They grow to be very large, often 60 feet high and from three to four feet in diameter. So, I firmly believe, that after taking into consideration the certainty of growing when transplanted, the rapidity with which it grows, the value of the timber when young, the usefulness of the fruit for the table and the leaves for silk worms, we have no tree of more value—the catalpa excepted—for our western prairies, both for present and future generations than the Russian mulberry.

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A correspondent of the New York Tribune gives another view. It is always safe to hear both sides. He says:

Many articles have appeared lately in agricultural papers strongly urging the planting of the so-called Russian mulberry upon the dry plains of the West. It is said to draw well during the drouths of the latter part of summer, and is recommended for thick planting in hedges and shelter belts, and for low coppice wood to be cut over every four or five years for fuel. There are most likely private interests at the base of these recommendations, for the mulberry is very ill adapted for any of the purposes named. Hedge plants to be effective must be untasteful to cattle, whose browsing would soon ruin them. The barberry, the privet, the sweet-briar, and the osier (Salix purpurea) contain a bitter principle which repels cattle; and as they are of dwarf dense hedgy growth, any of them makes a good permanent fence, proof against all animal trespass with the aid of a barbed wire to prevent cattle from pushing through.

The fruit of the mulberry is very poor and the wood is soft and light, and of little value for fuel even when taken from old trunks, and cattle destroy the plants whenever they can reach them. The growth is free in the latter part of summer because, like the peach and other semi-tropical trees, it does not gain the full impulse of growth until the weather becomes hot. This is a frequent cause of its failure to mature sufficiently to endure the winter. Peach-wood makes excellent fuel. The mulberry in our climate is scarcely worth planting excepting where it is intended to use the leaves for feeding silk worms, and it is doubtful whether the trees of any variety of the alba will long endure annual stripping in May and June where the seasons are too short for them to make sufficient subsequent growth to mature their new wood.

TIMBER STATISTICS.

From the official reports of the Department of Agriculture at Washington, we take the following statement showing the number of feet of pine at present in the States named, and the number of years it would last at the rate it is now being removed:

STATE.	Number of feet of pine.	No. of years.
Texas	21,508,000,000	300
Florida	6,615,000,000	30
Alabama	18,885,000,000	70
Mississippi	17,200,000,000	150
Minnesota	6,100,000,000	10
Michigan	29,000,000,000	7
Wisconsin	41,000,000,000	20
North Carolina	5,229,000,000	50
Louisiana	48,213,000,000	540
Georgia	16,778,000,000	75
Pennsylvania pine	1,800,000,090	5
" hemlock	4,500,000,000	15
Arkansas	41,325,000,000	320
California	25,825,000,000	100
South Carolina	3,316,000,000	27
Maine, pine and spruce	5,000,000,000	16

New Hampshire does not return a pine tree of any kind, but returned 1,500,000,000 of black spruce, which will all be gone in ten years at the present rate of cutting.

FORESTRY RESOLUTIONS.

At the meeting of the American Agricultural Association in Chicago in December, the following resolutions offered by Dr. John A. Warder were unanimously adopted:

WHEREAS, We begin to realize the lamentable wasting of the forest lands of the United States and the sad effects of their destruction upon the climate and water supply of the country, and we are forced to confess our need of the knowledge of the better management of the woodlands than is now possessed by the people; therefore,

Resolved, That we urge upon the State Legislatures the propriety of selecting judicious persons to act as "State Forestry Commissioner," whose duty it shall be to instruct the people in regard to forest trees and their production and management; said officers to report annually upon the condition of the woodlands in their respective commonwealths;

Resolved, That we beg of all the agricultural colleges established under the land grant of Congress that they shall lose no time in planting State arboreta and establishing forest experimental stations where all species adapted to the soil and climate shall be tested, and whence surplus seeds and plants may be distributed. Annual reports of these establishments to be made to the governors of the State and boards of agriculture;

Resolved, That Congress be asked to establish one or more experimental forest stations upon the public domain, where the propagating and testing of useful trees shall be the leading object, with the collection of seeds and plants to be distributed by or under direction of the United States agricultural department, to which bureau these stations shall make annual reports.

TRANSPLANTING EVERGREENS.

From a somewhat lengthy article in the Rural Home, by B. Gott, we cull the following good points:

First, In purchasing or removing evergreens, do so in cloudy, damp, or moist weather, and select those trees that are young and small in size, as the risk which is so very great in a large specimen is comparably nothing on a small one. The chances of success are ten to one in favor of the small sample.

Second, In the act of removing the trees carefully preserve and take up all the roots that it is possible to get. This gives the tree additional chance in proportion to the number and entirety of the small roots secured.

Third, While the tree's roots are out of the ground, either for a longer or shorter period, carefully keep the roots shaded and damp, and entirely from the action of the sun, air, and drying winds. These influences, while so very beneficial to the tops of the trees, are most surely suicidal to their roots.

Fourth, Plant the trees again as soon as possible after taking them up, and as carefully as possible, spreading out all the young roots to the action of the soil and tramp well. See that the soil is free from all stagnant and injurious water.

Fifth, Immediately after planting the trees carefully cover the ground for some distance round the trees with well decomposed manure or chip yard scrapings to the depth of four or six inches. This covering or mulching, as it is called, is professionally to be the great secret of successful tree planting, and especially so of evergreens. It tends to keep the ground cool and moist even in the dryest time, and is much to be preferred to any amount of watering.

Sixth, And lastly, if moisture must be applied, and something must be done to save the life of the tree in a very prolonged drouth, first take away the mulching and thoroughly stir the soil about the roots to some depth, and then apply water in plentiful quantities, then close all up again and replace the covering as before. Then quietly leave it alone to fight out the great battle of life, and in nine cases out of ten, it will—our word for it—most triumphantly succeed.

COMMON THINGS.

The Philadelphia Press, under the above title, after giving its opinion of nurserymen who will talk wisely about the beauty of the rare evergreens from abroad that ten chances to one will die on the hands of the purchaser, says:

When properly grown, nothing in the whole range of ornamental evergreens is superior to the hemlock and the white pine, and to recommend trees for the lawn and omit them seems like a slight to old and dear friends. The rich may sigh after something more "rare," and of course they can find it; but they can after all find nothing so adapted to all the needs of a lawn, for, besides being naturally stately, they can be dwarfed by cutting back, grown in clumps, and worked into arbors, arches or bowers, hedges or screens, or in single trees of medium or magnificent size. They are "common" in a sense because they are found wild in our forests, but so are all the varieties of maple which can hardly be surpassed in beauty, as well as the oak, the tulip, and the chestnut. It is a bad taste which ignores or despises their native qualities of stateliness and beauty to hanker after what is odd and awkward because it is not common. So some men hanker after old and rare books merely because they are old and rare, though they may be of no earthly use except to exhibit as antique curiosities for the entertainment of guests. Some men would pay thousands for a copy of Elliott's Indian Bible, and yet could not be induced to spend a cent for the founding of a neighborhood library. These eccentricities of taste are not creditable, and it is to be hoped that farmers especially will not be led astray by them, and be taught to ignore the beauty which nature has lavished all around them in abundant profusion.

EVERGREEN SCREENS.

In regard to the beneficial results derived from protective timber belts, Prof. C. S. Sargent, Director of the Botanic Garden and Arboretum of Harvard University, after quoting American and European authorities, and citing instances in proof in his "suggestions on tree planting," says:

The influence of belts of trees, especially of spike-leaved species, on local climate is important. Such plantations serve as a material check to the natural force of cold winds from the north, which rapidly lower the temperature, hasten evaporation, and blow into drifts the snow, which would otherwise protect the ground with an even covering. There is no probable way in which the farmers of the northwest could more easily or more rapidly increase its agricultural product than by planting such screens from the northeast to the northwest of their farms, and their attention is particularly directed to the importance of this subject. Such plantations would be too limited in extent and too widely scattered to have any general influence on the climate or the flow of water courses; but as a means of direct profit it does not seem unreasonable to predict that such protection to our fields would increase the profits of their cultivation fully twenty per cent.

Orchards thus protected are still productive, and all gardeners know that plants generally supposed too tender to withstand our climate will thrive when planted under the protection of a garden wall, or among evergreen trees. What garden walls are to the horticulturist, those broad evergreen plantations should be to the farmer.

JUNIPERUS COMMUNIS DEPRESSA.

M. Milton, in the Country Gentleman, says that the above named evergreen naturally grows compact, and uniformly in shape, but should a branch extend beyond the others, by attending when young and cutting back to proper shape, it can be kept always an attractive bed. How many there are of our hardy plants which can be utilized in making the surroundings of our homes beautiful; and as it is not advisable to plant large evergreens too close to dwellings, these small prostrate growing kinds can be planted with good effect, and make the lawn more lively-looking during winter. The foliage of this plant does not get disfigured by change of color during winter, but maintains that light and pleasing color so attractive at this season. It grows only about two feet high, and although the branches extend on every side the center keeps well furnished with branches and foliage. As it does well on almost every kind of soil, it is desirable in many positions where other similar plants do not succeed well. The junipers are found, in their native habitats, often growing well on poor, gravelly soil, but good cultivation has a marked effect on them as well as upon almost everything else in the vegetable world.

EVERGREENS UNDER DISCIPLINE.

Josiah Hoopes in answer to a query in the New York Tribune as to the best evergreen tree that would grow tall but not spread much at the base, says that one can cause any evergreen of whatever species to adapt itself to this requirement. Nothing easier, and yet many cultivators still believe it is ruinous to use a knife on evergreens. Years of practice have demonstrated that no class of trees is more tractable, and, strange as it may appear to some persons, there is not a species known but what will form a new leading shoot without any difficulty. Begin when the tree is young, and every season (June is as good a month as any) with a strong pair of shears clip off the shoots to promote a denser growth and to prevent the branches from extending beyond a prescribed limit.

Should the specimen incline to run up tall and slim, nip off the leading shoot, and this will generally induce numerous others to start out. As nature in her endeavor to supply a new central branch frequently overdoes the matter and furnishes an over-abundance, allow but one to grow, and that the strongest and in the most central position. There are a few varieties of some well-known species that assume the columnar form without artificial assistance, as for instance the pyramidal Norway spruce, and occasionally a sport of the American arbor vitæ. Although not hardy in the northern States, the pyramidal form of the European cypress is also a striking example. But such remarkably spreading trees as the Norway spruce, hemlock, and the white pine may be compelled to assume the strictly erect growth by a systematic course of pruning such as has been described. In addition to the buds which are plainly observable on the branchlets, there are others beneath the outer bark, termed "adventitious buds," that are not noticeable, but which start into active growth whenever vegetation receives a check, either from removing a shoot or from the effect of disease of some kind. Among evergreens as a rule however this is not so marked as among the greater portion of the deciduous trees, but still sufficiently so to produce a denser growth of branches after pruning. After several years of continued pruning any species of tree adapts itself to circumstances, and requires little aid from the knife, as is abundantly proved in the case of old evergreen hedges and specimens of "topiary" work. At first trimming induces active growth, but after a few years it does not act as an incentive.

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At another time Mr. Hoopes talks about the pruning of evergreens as follows:

The last of June is as good a time as any in the year for pruning them, as the new growth is not then hardened, and the wood has time to ripen properly before cold weather sets in. True, some evergreens will endeavor to effect a second growth, but as this is generally weak, it, too, will mostly ripen before frost. All species are benefited by an annual pruning until they grow beyond our reach. The objections that have been raised in regard to the stiff formal character that pruned evergreens assume may have some weight when the trees are small, but as they increase in height and the clipping is discontinued the training of their early years shows to great advantage.

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Upon this same point the American Gardener says:

Evergreens should never be pruned in the fall or winter. The cutting off of the summer's growth during this season exposes the inner parts of the tree or hedge to the snow and cold winds of winter to their serious injury. Thousands of hedges are annually destroyed by such unseasonable pruning. Spring is the time for pruning evergreens, especially when large limbs are to be removed. Hedges which are to be kept as even and neat as possible may be pruned the latter part of June or first week in July. At this time the new growth is still soft, there is no danger from cold injuring exposed parts, and there is sufficient time for the ripening of the new wood before winter.

HEDGE PLANTS.

Wm. S. Little in the Western Rural speaks well of the hornbean as a hedge plant, condensing the points as follows:

1. It is perfectly hardy and healthy. I have never seen a twig injured in the severest winter, nor have I ever observed that it failed to make a healthy, vig-

orous growth, uninjured by excess of wet or drouth, or troubled by insect enemies.

2. It is very easy to transplant.

3. Bushy in form, rigid in growth, and yet rapid enough, it seems to be a natural hedge plant. Moreover, as we have seen, it is wonderfully patient of the knife, and may be cut to any extent with impunity.

4. It is easily trained and tended. Probably in the earlier stages the hedge would be improved by braiding and intertwining the tough young branches, according to the European method, but for after treatment I have found that one trimming at mid-summer is all that is required to keep it in perfect shape, and this with very little labor.

5. Cheapness. If a demand for plants should stimulate their production they could be afforded at least as low as most of the well known hedge plants.

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C. E. Hewes in the Cultivator speaks full as highly of the beech for hedges. We condense as follows:

All who are acquainted with the growth of the beech in open land know how scrubby its growth is, and that it seldom attains a height of more than 12 or 14 feet. I do not recommend this hedge for ornament, for it cannot be said to be very handsome, neither would I recommend it for cross-fencing, but for a line fence which is to be permanent it is just the thing—rapid in growth, so hardy that it withstands the severest cold of winter and all climatic changes, and so tough and stiff in texture that when it has grown to half the size of one's wrist, the largest, strongest, and heaviest beast on the farm cannot break or bend it. The beech hedge when once firmly established needs no repairs and will last a "short forever," and when it begins to die death will first show itself on the topmost branches, working slowly down, requiring perhaps years to kill the lower ones. Sowing the beechnut is comparatively an inexpensive process. One a little more expensive is to transplant very small saplings from the woods which (if they do well and are not much retarded by transplanting), take root and start quickly, will do equally as well as sowing the nut, and give a hedge sooner. For a permanent hedge I should say try beech, either by transplanting or sowing the nut.

ORNAMENTAL GARDENING.

ORNAMENTAL GARDENING.

Josiah Hoopes, than whom there is no better authority upon matters of ornamental gardening, says concerning the growth of taste in matters of home ornamentation:

When I was a boy people planted their lilacs, snowballs and syringas in straight lines, or with mathematical precision along the fence. As the collection of shrubbery increased they were then scattered equidistant over the entire area, reminding one of a thinned-out thicket. Gradually as the taste for landscape gardening grew on the minds of our people, grouping was substituted for the formal style, and natural clumps and belts of shrubbery succeeded, which pleased the eye by its pretty contrasts of color and form, and we thought we had arrived at perfection. Of late years, however, still another style has been adopted, which is a decided improvement on any system previously practiced. The shrubs are planted with plenty of room, in belts or masses, and herbaceous plants of a sub-tropical aspect are introduced among them. The shrubs themselves should consist of such kinds as are remarkably striking, even when not in bloom, as for instance the variegated leaved wiegelia, purple-leaved burberry, purple hazel, cut-leaved lilac, etc.; or some species with remarkably showy bloom as the hydrangea grandiflora, cydonia japonica, tree-pæonies, etc. Sometimes very pretty effects are produced by introducing a low-growing Kilmarnock willow or dwarf weeping cherry. But the greatest charm connected with these groups is in the rare contrasts formed by planting among the above such graceful plants as the variegated zebra-striped eulalias, pampas grass, erianthes ravennæ, panicum virgatum, or arundo donax. Then there should be a few bold subjects suggesting a sub-tropical appearance, as for instance cannas, in variety, ricinus, wigandias, colocasias, yuccas, and even tobacco and sunflowers are not amiss. An occasional lily, gladiolus, and tuberose stem peeping up above the surrounding foliage will lend an attraction to the picture, which, when artistically arranged, cannot but please the most fastidious taste.

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Continuing this subject we cull as follows from the Country Gentleman: It is a source of gratification to all who are interested in the promotion of any refining influence in the community at large, to witness the gradual advancement of ornamental gardening through every part of the country. We may see this illustrated in riding through our villages. Twenty years ago, scarcely one dwelling in twenty presented beautiful house plants in the windows. Now, in some places at least, there is scarcely one in twenty that is destitute of them. The tall grass and weeds which grew in door yards have given place to the green carpets of smooth lawns. There is also in some places an earnest effort to make the public streets put on an air of respectability and finish by abolishing rubbish heaps and rank weeds, and replacing them with smooth grass and shade trees. It would be interesting information to know how many lawn mowers have been bought within the past ten or even five years. Their influence is visibly seen. The editor of the Gardener's Monthly enumerates some of the causes, which have operated in promoting the present improvement, and among them he names the agency of periodical works, the influence of the Centennial at Philadelphia, the work of the tree agent, "who brought nice things to the most impossible places," the liberal postage laws, by the aid of which myriads of flowering plants are growing everywhere, to which may be added the admirable examples afforded in the ornamental grounds which a few men of taste have presented to their neighbors, bringing out a dormant passion in many minds which is sure to grow and spread. Nurserymen and seedsmen deserve a large share of credit for the dissemination of trees and plants and the taste to grow them. Mr. Meehan seems disposed to ascribe much of this reform movement to the ladies and to agree with the remark of the German stage driver, who said when a pretty flower garden was pointed out to the travelers, "Vere dey haf vimins, vlowers always ish."

FRUIT TREES FOR ORNAMENT.

Although we may not entirely agree with the Indiana Farmer in all that we quote from it in the following, still there is an excellent sentiment running through it all:

Can any one tell me why a grape vine is not a suitable ornament for a front porch, or what would be the objection to a fine, standard pear or grand wide-spreading apple tree in the lawn? Was ever a blossoming shade tree more beautiful than either of these when the flowers come out? Is not the rich green of the leaves a thing of beauty all the season? When the purple clusters hang thick on the vine and the red apples and juicy pears shine through the leaves in autumn it certainly could not take anything from the beauty of the scene. When one has but little space, as in a village lot, could not the useful and ornamental be profitably combined by putting in handsome fruit trees in the place of those designed only for shade? And a pretty dwarf pear or two would look well among the shrubbery. A row of young cherries before a fine house with a many pillared porch is one of the pleasant memories of my early walks to school. The old doctor who owned the property gave those trees as much care and attention as he ever did a rich patient. He was almost daily doing something for them, if it was only to pour a bucket of suds about their roots, loosen the ground a little, or bury a dish of bones under the soil. But their marvelous growth was the wonder of the village, and in a very few years they cast a deep shade over the whole sidewalk and yielded a bountiful supply of great ox-heart cherries. Let us give our children all such memories we can, for they are healthful for mind and body both. Fruit or no fruit means riches or poverty in the minds of our little children, and there is certainly a thriftiness about a home well supplied with this luxury which is better than an old stocking full of hard dollars in the strong chest, with only one old crab-apple tree in the pasture lot.

ORNAMENTAL TREES.

The following select list of ornamental trees for grounds of some extent, was made by H. H. Hunnewell, whose magnificent place near Boston is well known as one of the finest specimens of landscape planting in America:

DECIDUOUS TREES.

Elm, American,
" English,
Oak, White,
" Scarlet,
Maple, Sugar,
" Norway,
" Scarlet,
" Japanese atropurpureum,
Other Japanese Maples,
Beech, American,
" Copper,
" Weeping,
Cut-leaved Weeping Birch,
Tulip tree,
Magnolia acuminata,
Magnolia Lennei,
Linden, European,
" American,
Virgilia lutea [Yellow-wood],
Salisburia [Gingko],
Dogwood,
Catalpa,
Flowering Cherry,
Common Chestnut,
Liquidambar,
Weeping Willow.

CONIFEROUS TREES.

Abies alba [White spruce],
“ Canadensis [Hemlock spruce],
“ excelsa [Norway spruce],
“ orientalis [Oriental spruce],
“ menziesii,
“ alcoquiana,
“ Douglasii,
“ nordmanniana [Nordmann's fir]
“ cephalonica,
“ picta,
Pinus lambertiana,
“ pyrenaica,
“ excelsa,
“ strobus [White pine],
“ cembra,
“ sylvestris,
Sciadopitys verticillata,
Larix Americana,
“ Europæa,
Retinospora obtusa,
“ plumosa aurea,
“ filifera.

SHRUBS WITH ORNAMENTAL BERRIES.

In answer to inquiries for a list of shrubs and small trees which produce ornamental fruit after flowering, and after the leaves have fallen in autumn, the Country Gentleman names:

Prinos verticillatus, or Black Alder, which grows wild in muck swamps, and bears a profusion of scarlet berries, which continue through a large portion of winter. It grows well, and produces its masses of berries when removed upland.

Celastrus scandens, Bittersweet, is a climber, and with its clusters of orange-scarlet fruit may be made a graceful display in winter.

Berberis vulgaris, the Barberry, is ornamental as a shrub when in flower, and also with its beautiful racemes of berries, the purple variety being the most ornamental.

Euonymus atropurpureus, Burning Bush.

Viburnum Oxycoccus, the Bush Cranberry.

Symphoricarpus racemosus, the Snowberry.

Juniperus Virginiana, the Red Cedar, some trees of which bear a profusion of blue and purple berries, which have a singularly beautiful effect in winter, in connection with the dark green foliage of the trees.

Sorbus Americana and *aucuparia*, the Mountain Ash, with their several varieties.

Shepherdia argentea, the Buffalo Berry, bears dense masses of orange-scarlet berries, and, being diœcious, it is necessary to have staminate and pistillate plants growing together. It is a shrub of straggling growth, but by pinching back and training, it may be brought into a symmetrical shape.

Crataegus pyracantha, the Evergreen Thorn, is a low-growing evergreen shrub, which, late in autumn and early in winter, affords a fine display of dense clusters of red berries. Being slightly tender, it should be planted in the shelter of evergreen trees.

BORDERS OF SHRUBS.

Wm. C. Barry, in an address before the American Nurserymen's Association, advocated the increased employment of shrubs for borders inside the fences which bound gardens and lawns. These borders can be varied in depth, according to the size of the garden. They should be a little higher than the lawn, and the outer line should consist of graceful curves. In these borders can be planted a variety of shrubs, dwarf conifers, hardy plants, etc., but no trees. The shrubs and conifers should be planted irregularly, from three to four feet apart—the taller ones nearest the fence, and the dwarf subjects near the margin. For a border six feet in depth he suggests two rows of shrubs, the first consist-of the larger-growing ones, like Weigelia, Deutzia, Forsythia, Japan Quince, Viburnum, Cornus Variegata, Red Dogwood, Tartarian Honeysuckle, Lance-leaved Spiræa, Syringa, Althæa, Calycanthus, Plum-leaved Spiræa, Barberry, Dwarf Spruce, Pine, and Juniper.

For the second row, Deutzia gracilis, Mezereon, Dwarf and Golden-leaved Syringa, Tree Pæonies, Dwarf Double-flowering Almond, Prunus triloba, Dwarf Weigelia, Fortune's Dwarf White Spiræa, Plumed Hydrangea, Spiræa Thunbergii, Juniperus squamata, and Tamarisk-leaved Juniper. The outer edge can be formed of Funkias, Dwarf Phlox, Japan Spiræa, Evergreen Candytuft, Perennial Phlox, Forget-me-not, Lungwort, Soap-wort, Sea Pink, Sweet Violets.

Between the shrubs, near the front, may be planted Lilies, Tall Phlox, and occasionally Hollyhocks.

SCARLET CLEMATIS.

The Ladies' Floral Cabinet speaks very highly of the Clematis Coccinea. Its flowers are from one, to one and a half inches long, bell-shaped, and of the most intense coral scarlet, shining as if polished, and are produced from the axil of each leaf, on strong, wiry foot-stalks three to four inches long, standing out boldly from the foliage. The leaves are of a rich, deep, shining green, deeply lobed and of a thick texture. The plant is like the old and well-known species *Crispa*, herbaceous, dying down to the ground each year. Its first flowers appear in July, and are produced in great abundance until the plant is cut down by frost. It is very desirable as a pot plant, particularly in localities subject to early frosts.

AN ORNAMENTAL FENCE.

The Canadian Horticulturist gives a good hint in saying that most people make a mistake in trying to grow climbing plants. They put up the most unnatural things for them to twine or climb up, and they have to be tying, nailing, and otherwise fixing their climbers all the time, when, if they paid some attention to these plants in a state of nature, they would learn a lesson. A few straight sticks, if placed upright in the ground among twining plants, will lead them up to other things, so that they can twine and grow higher. A barbed wire fence can be made pretty if morning glories, or even the *Echinocystis* (wild cucumber) is sown along it, and a few sticks put so that the little plants can reach the wires above them. The best thing for making a fence in a garden, to be ornamental, or for climbers or twiners to grow upon, is wire netting, with about four-inches meshes. This can be bought for about fifty cents a yard, and a yard wide. It makes an elegant low fence, if everlasting or sweet peas are sown along it. Or it is improved by mixing in the taller kinds of nasturtiums or scarlet morning glory.

BITTER SWEET.

We have for years admired the shrubby Bitter Sweet of our woods, and have transplanted it to various locations with success. This beautiful vine is sometimes called Wax Work, on account of its beautiful clusters of orange colored berries, so showy and elegant in winter. It grows wild all about here, in hazel, sumac, and woody barrens; is easily transplanted, often coming up from sections of roots. It is also called Staff-tree, from its habit of winding around a small tree, making a twisting staff of it.

Suel Foster in Neltnor's Magazine suggests the following employment of this vine which is new to us, and there is no question but it would be strikingly beautiful. He says: Plant an American Arbor vitæ, and keep the top cut back so it will grow bushy and low, and plant the Bitter Sweet by the side of it, and give it good soil, and mulch on the surface of the ground, then in winter when there is so little in the front yard to admire, it will be the observed of all observers.

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Mr. Wm. Falconer, in the Rural New Yorker, writes suggestively concerning vine clad trees as follows: I never saw the trumpet creeper appear so beautiful as in the Southern States, where, on the outer edge of a river bottom timber belt, it almost hid from sight the trees it grew on. I never saw the wild clematis look so fine as in a wood in New Jersey, where Mr. Taplin pointed out to me a tree literally covered with the vine, which hung in massive drapery to the ground, and was then in bloom. It is a common thing to train Jackman's and other kinds of garden clematis up among the branches of trees, where, when in bloom, they have a fine effect. The Virginian creeper is sometimes treated in the same fashion for the brilliant effect of its foliage in the fall. The Chinese wistaria is one of the best of vines for this use, and the Periploca, akebia, and honeysuckles may likewise be used to good advantage. The Canada moonseed and climbing waxwork will enjoy themselves exceedingly among the lower branches of the trees, and the Dutchman's pipe delights in such liberty. Bare stems of trees may be covered with Japanese ivy—Ampelopsis tricuspidata. On many a farm is a wooded ravine, and this is just the place for vine-clad trees. I remember, when visiting Robert Douglas, at Waukegan, Ill., with what glowing pride the veteran "Forty-niner" brought me in front of a wooded ravine near his house, that I might see the splendid effect of the trees upon the distant bank, whose limbs were bending with the load of drapery which they supported, and with what a gleam of satisfaction he pointed out the many trees—big trees now—he had planted there, the vines that he had encouraged to grow upon them, and the undergrowth, both herbs and shrubs, that he set out there. He had snatched from desolation an unsightly, gloomy chasm, and planted it with trees, and shrubs, and vines, and thus secured what is to-day one of the prettiest ravines or glens in Illinois.

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The New York Tribune in a more utilitarian strain talks in this way of grape vines upon trees: Grape vines are trained upon trees to a large extent in parts of Italy, which next to Greece perhaps, is the oldest European home of the vine. Our American vines, of stronger and far-stretching growth, are still more at home upon trees, and more averse to being confined to stakes or stools than the compact and close growing Vitis vinifer. They seem to prefer a living tree to a dead one; their leaves apparently enjoying the exhalations from those of the tree which supply them with a constant moisture, too often deficient in our summer air, and which enables them to resist attacts of mildew. In Italy the elm is most purposely used as a vine-bearer. Here, trees of any kind, not thorny or very brittle or open-headed, serve the purpose well; but the best results seen by the writer have followed by several years since a cane of a Concord managed to reach the side branch of a black spruce. The dense foliage of this hardy, compact, firm-branched evergreen carries the vine well and with no apparent injury to itself; a ladder can be placed against it any where for pruning, thinning and picking; and, what is best of all, the grape bunches are all perfect, untouched by mildew, rot, bird, insect, or thieving hands. No such perfect unbroken bunches are found on any other of many differently trained vines in the same large garden. The fruit hangs safely to the last, an object of much beauty—"just like a great, big Christmas-tree," a wee little wonderer exclaimed on seeing it.

FLOWER BEDS.

The Michigan Farmer says that a flower garden or flower beds upon a lawn or in a front yard should be in close view of the windows of the sitting-rooms. The beds should be symmetrical, of simple shape, never too large, separated from each other by broad strips of grass, which set off the colors of the flowers to the greatest advantage, giving continuity, unity, and breadth to the whole Where the beds are separated by grasses, masses of flowers of one color are very striking and effective. In a small garden laid down with grass the fewer walks the better. Regular figures for the beds, such as ovals, circles, parallelograms, or squares seem to be preferred as capable of being more easily and pleasingly filled up. It should be always borne in mind that the first object of a flower garden is to display flowers. The figure of the flower bed, however, is a subordinate consideration. Beds should not be scattered broadcast over the lawn without any connection or relation between them. Hearts, crowns, stars, animals, letters, or similar devices are entirely out of place, and though eminently artificial have a very low place in the domain of art.

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Mr. W. C. Barry likes to have a clean lawn with ornaments at the borders. From the middle of an address by him we quote as follows:

Thus far I have not referred to flower beds in lawns. It is a common practice to make beds of geraniums in the center of a lawn. If the style of gardening which I have suggested be carried out a flower bed of this kind would be out of place. Geraniums and other bedding plants may be employed to advantage close to the house, and can be cultivated either in beds or in borders. A fine border of mixed plants, consisting of tea roses, heliotrope, double feverfew, with coleus and centaureas intermingled, presents a beautiful appearance, and is very useful for cut flowers. Being near the house they are easily accessible and do not detract from the beauty of a lawn. The edges of groups and borders of shrubs are beautified by the use of such plants. We cannot admire great masses of geraniums, but employed as they should be, they enliven a garden, and may be considered indispensable.

THE INNER HOME.

Mrs. E. A. Horton of the Coldwater Grange read a beautiful essay on home decoration, from which we cull the following extract:

In decorating the inside of our homes art is but in its infancy. Most of us can remember when the decorations of the parlor consisted of the looking glass, pictures of the Washington family, of General Washington with old Whitey (his horse), of General Lafayette, and the family record neatly framed, and perhaps the silhouette of some dear old granddame in the days of her youth. There was asparagus around the glass and picture frames, and in the summer, bushes in the fire place, and a plaster of Paris dog on the mantel—was it so long ago, after all? The first attempt to grow plants in the house I ever saw, my mother filled an old sugar bowl with cotton, moistened it and sowed wheat in it; it grew beautifully and sat on the mantel all winter and delighted our childish eyes with its greenness. It is from just such beginnings that the present state of decorative art has grown. Who does not remember the old fashioned testers and bed curtains? They were but the forerunners of the lovely canopies we all admire. The old stick chimney with its open fireplace, its brick hearth and broad mantle, were but the unformed idea of the beautiful grates and marble mantels we now see in the homes of wealth and culture.

I am firmly convinced that much of the fancy work we put up in our homes is sheer nonsense, and as far as real decoration goes is a miserable failure, because of the lack of harmony in the whole. There is the whole secret of success in decoration—harmony, harmonious arrangement of colors, of fitness of the whole combined. Our efforts are a success or failure, or the effect is indifferent, and we feel illy paid for our labor and poorly satisfied with our taste, just in proportion as we follow its laws. But it is well to try, even if now and then, to have an ideal in mind to strive after. Why I know a lady who raised ducks for two years to buy silver knives and forks to use on her table every day, that her table might satisfy her love of beauty, and she said to me, "Mrs. Horton, I have always been glad I did make the effort, for I have never been ashamed of my table since, and the family have all enjoyed them so much." It seems to me her efforts were more praiseworthy than the work of a lady I heard of the other day who is embroidering coffee sacking with wools for a dado to extend around the room. We find the true and the false everywhere, and here is the rock on which we split. To discern which is which culture alone will decide the point to our satisfaction. What was beautiful to us twenty years ago is but passably so now if we have improved as we should our opportunities for observation.

There is no field where there is greater need for improvement, or more room for the exercise of our taste than in decorating our homes.

Let us not live in vain. Let us leave behind us monuments of beauty in the homes we shall soon go from to enter no more forever. Let our children say with pride, "Father planned this house—is it not tasteful? This yard—is not the arrangement of the walks and trees fine? Ah! he was a man of taste. And within, mother planned this cornice and this arrangement of rooms, liked this combination of light and dark woods in the finish, suggested this tint of wall for this room, and that for the other—her taste was exquisite, only equaled by her judgment, which, of course, must always accompany taste, or all will be imperfect."

MISCELLANEOUS PAPERS.

HORTICULTURE FOR CHILDREN.

BY MRS. A. L. ALDRICH, FLINT.

In no age of the world have the needs, the capabilities, and the dignity of childhood been ignored, but at no previous period have the thought and intelligence of the time been as carefully directed to the development and growth of the youthful mind as now. Educators all over the land are devising the best means of utilizing the period of childhood as a foundation whereon shall stand the noble man—the best and greatest the world has yet produced. It has been proved a fallacy that the child must wait until he is "old enough" to learn. One of the wisest men of our time says: "It is the supposition that the several sciences constitute a succession of studies, some of which are adapted to childhood, others to the middle age of youth, while others can be mastered only by the mature mind. Whereas, the truth is, all science begins with simple facts—facts so simple that little children learn them, are conscious of them, begin to apply them, and only cease this normal awakening when we set them at tasks, with text book, formula, and theory, which leave no room nor time for natural development. Education may begin in the domain of horticulture. We know how the child will reach for a flower; that may be its instinct for color, or its imitativeness in regard to sense of smell, but almost as soon as it can walk beside you, show it a maple tree, and a fir, tell it the name of each, with some differences, adapted to its capacity for observation, and you will wait for its next remark with interest. It will undoubtedly be, 'There is another fir tree, and there another maple,' showing you that your object lesson has not been lost. Perceptive faculties thus aroused never again become dormant. The next day the child imparts his information to his playmate, and is a hero. Later, show him the different varieties of maple, point out to him the characteristics of deciduous, and of evergreen trees, and continue this teaching, until his interest is thoroughly awakened, and he knows the name and history of every tree and shrub surrounding his home, and in his immediate vicinity. Thus he will acquire the habit of observation, also the habit of conversation, which is no less useful. Earlier than you would think of suggesting it, the child will be transplanting trees, or sowing seeds, the natural desire of proprietorship asserting itself. Naturally, with this preliminary training, he takes to delving in the soil—to gardening. And just here is where nature's nobleman, the horticulturist, is so often lost to the world. He becomes discouraged, because he does not succeed. He needs to be taught the results of experience, to be encouraged and helped at every step, then will he go on loving the work as he loved learning about the trees. Intelligent foresight and thought will help him to select the right seed, whether flower or vegetable; the right shrub or fruit tree or currant or raspberry, and to choose the right soil for each. Then introduce the study of chemistry and of physiology; show him their application to plant life, teach him how the plants select and assimilate their food, the effect of stirring the soil, the uses of sunlight and shade, and you will be astonished at the result. It will be only a season or two before the child, still but a youth, can go alone and intelligently in this matter of cultivation. A great aid in addition to his love of knowledge, his instinct of proprietorship, and his desire for something to do, is to have a practical end in view. Some children love best to have the flowers appreciated for home decoration; some that they may use or furnish them to decorate the church, some to supply friends, some to sell. The same is true of fruits and vegetables. Study the character of the child, and use those means for help and encouragement which will best subserve that end. Enjoy the beauty and the fragrance if that will prove the best stimulus; purchase of him radishes, melons or cauliflowers, as you would of your grocer, if that will best keep him at the work. Let the pickles, and the catsup, the canned strawberries and raspberries be the product of his garden. We mistake, and dwarf the capabilities of many a young horticulturist by putting this subject wholly within the range of sentiment. Work ofttimes grows in importance and interest if its proceeds help to gratify little wants. The time will come, and soon, when we will not need to dwell so strongly upon this matter of encouragement. When this form of labor has become popularized, and it has become the fashion for every boy or girl to cultivate a piece of ground, we may simply furnish information, and its application will be readily made. As a hastening of this glad time, encourage enthusiasm. The bursting bud, the opening blossom, the ripening fruit, are each an inspiration. Its spirit stirs within the child; help him to a conscious understanding of it.

THE FUTURE OF MICHIGAN AS A FRUIT GROWING STATE.

BY T. T. LYON.

During a residence of fifty-four years in Michigan we have seen the dense forests which, at the first, clothed almost its entire surface, opening northward from year to year; and we have also at the same time felt the stealthy tread of the more fitful or paroxysmal climate of the prairie regions as it entered upon attack, apparently a lasting possesson of the defoliated regions.

We have, co-extensively with this denuding process, seen the more tender fruits which seemed at home under the sheltering ægis of the primitive forests slowly give way under the influence of this duplex process; keeping pace in an apparently unnatural movement northward, with the decadence or disapearance of the forests.

More recently we have watched the developments of a "fruit belt," along the borders of our circumscribing lakes, with the expectation that, since these grand bodies of water, unlike our forests, cannot be swept away, and, by their destruction, be made to minister to the insatiable greed of business and commerce, the climatic advantages they offered might be considered as permanent. A more full and intimate consideration of the case has, however, led us to the conviction that even this conclusion must be accepted with many grains of allowance; since the desirableness of the land near the lake, for fruit growing as for farming, is rapidly inducing the destruction of the timber, a process which is rapidly spreading inland. It is doubtless the fact, that the disadvantages growing out of this clearing up of the lake shore region are, climatically considered, but slight so far as westerly winds are concerned; and it is certainly true that our prevailing winds are from that direction. But on the other hand, our easterly winds, although less common, come to us with added impetus; and with fewer forests in our rear, reach us with a lower temperature than formerly, bringing to us, as the present spring has forcibly and feelingly demonstrated, lower degrees of temperature and more destructive frosts than have been heretofore known, a process, which, to our apprehension, is almost certain to become still more effective, as the removal of timber in the opening of farms progresses. It can be of comparatively slight advantage to the "Peach Belt," that the equalizing influences of our prevailing lake breezes protect us in the effort to grow the more delicate fruits, so long as each passing year is increasing their liability to destruction, by chilling blasts from over the denuded lands in our rear.

The influence of forest shelter for the more delicate fruits must, in the very nature of the case, become less and less effective as we go northward; and for the same reason, the lake protection must be supposed, other circumstances being equal, to become restricted to a narrower limit. These conclusions must, so far as we are able to discern, apply with their full force to the growing of all the larger fruits, limited, possibly in the case of the apple, and possibly also of the pear, by the consideration that the greater hardiness of their fruit buds, and their later season of bloom, limits the question in some sense to the consideration of the sufficient hardiness of the trees.

The peculiarities of our more northern climate offer an added encouragement for the growing of these last named fruits, in that region, in the very important fact that those long-keeping varieties rarely become over-mature, in autumn, and hence go into the market later and in better condition than is usually the case with even the same varieties grown further south.

With these small fruits generally, the northern half of the lower peninsula, and (so far as can be inferred from the natural or indigenous growths of the country) the entire upper peninsula possess peculiarities of climate which peculiarly adapt them to their growth and profitable fruiting, so soon as the requisite markets shall have been developed, or facilities supplied for conveniently reaching those already in existence.

The following are some of the advantages offered: So far as the plants are concerned, winter so treads upon the heels of summer, that even the most tender European raspberries (Rubus Idæus) become covered with snow before the occurrence of temperatures at all dangerous to the plant; while the persistence of the snow carries such protection nearly or quite through, till all danger from cold in the spring is fully past. That such covering must be equally effective for raspberries of all varieties, as well as for blackberries, currants, gooseberries, and grapes, hardly need be remarked. It will be readily perceived that the advantage of late ripening will apply to the small fruits with quite as much force as in the case of the larger ones.

FREE TRADE IN HORTICULTURAL PRODUCTS.

BY C. W. G.

The tariff commission has been swinging around the circle taking testimony from representatives of all classes of business affected by the present tariff laws; but judging from reports which come to us through the press the testimony is largely one-sided in the protection rut. Producers have rarely appeared before the commission. In two instances however horticulturists have made arguments in favor of reduced duties and free trade in certain products that have met the approbation of the farmers and fruit growers of the west. Hiram Sibley, who is spoken of familiarly as "the biggest farmer in the world," made a very candid statement before the commission, and fortified it with concise and well arranged logic. We simply quote his conclusion:

We advocate in the interest of American farmers and seed dealers the abolition of import duties on all flower seeds and vegetable seeds, except beet, carrot, lettuce, onion, parsnip, and turnip, upon which there is no objection to a low tariff of ten or twenty per cent. We assert it is not right to impose a high tax upon seven million seed users for the benefit of one hundred seed growers.

The policy of a tariff upon imported seeds seems at war with the policy of the government, which now distributes seeds of food crops freely among growers. Again, the present discrimination against certain grains for seeds in favor of grains for food is unjust; if any difference is made it should be in favor of the seed, according to the present policy of the government, which admits live stock for breeding purposes duty free.

Later when the commission was in session at Chicago, Mr. Parker Earle, president of the Mississippi Valley Horticultural Society, representing fifteen States, appeared before it under the following resolution presented by Mr. Plumb, of Wisconsin, and Mr. Garfield, of Michigan, and adopted by the society:

Resolved, That it is the sense of the Mississippi Valley Horticultural Society that there should be absolute free trade in horticultural products of domestic growth between the United States and the British possessions, and that the president of this society be requested to present this matter to the United States tariff commission, and to urge the use of its influence to forward this end.

Mr. Earle stated that we were peculiarly interested in the American tariff imposed upon fruits of Canadian production as well as the Canadian tariff imposed upon fruits exported from this country to Canada. He said that between 1854 and 1866 we were working under a reciprocity treaty which was terminated at the latter date by a notice from our government. Under that treaty the trade in horticultural products between the two countries began to be built up, and has continued to grow even since the imposition of duties. There is no question but it is the wish of our Canadian friends to have free trade in these products. The Canadian duties were imposed very largely in a spirit of retaliation. The duties on fruits average about twenty per cent against fruits of the States. He said, from reliable sources he was informed, that an immediate repeal of this tax would follow a similar release on the part of our government, which would again establish free trade in these articles and thereby result in great convenience to all persons engaged in commercial fruit growing on either side.

The amount of traffic is greatly diminished by the embarrassments connected with the collection of duties. Even now several hundred car loads of apples are imported each fall when they are needed to supply our northwest.

This trade depends upon the season When the fruits are comparatively light on this side, we wish to import from Canada, if they have had a good fruit crop there, and it is for the welfare of our people that such importation should be as free as possible. And we are constantly exporting, from the commencement of the season in the gulf states, the early fruits and vegetables all up through the valley of the Mississippi until they begin to ripen at home, berries, pears, peaches, apples, etc. That traffic is becoming considerable, and this exportation will be relieved from embarrassment very soon after this government takes action to make the importation from Canada free of duty.

Mr. Earle wished to express the idea that the duties imposed were not in the least protective. Producers were not aided on either side, and illustrated as follows:

The gentlemen in Canada who may be growing tomatoes or strawberries are not protected in their interests, because there is a duty of forty cents on a bushel of tomatoes and two cents on a quart of strawberries, and twenty per cent *ad valorem* on peaches or pears, or American fruits, and because at the time the fruits are taken from America into Canada they have no fruits to bring into their own market. As soon as their products appear in the season our fruits seek no market there; hence their interests are not promoted by this tariff. We do not usually bring apples from Canada to any extent, for we have an abundance of apples on this side of the line, and the freight charges are quite heavy and the expenses attending it, so that there is no reason why it should be done. The fruit-raisers do not feel that they are protected, but rather that the whole question is involved in embarrassments and inconveniences on account of the existence of duties on the other side.

He urged that our government does not certainly need the very small revenue which accrues from this trade, and without doubt the Canadian government would manage to get on very comfortably if it were cut off.

There is no good reason for this continuance of a tariff which protects no one and which restricts a trade that for the good of all parties should be stimulated. When our northwest can not be supplied by home production it wants Canadian fruits to be admitted freely and no harm will come to our fruit growers. On the other hand our brothers in the British possessions are all anxious to have the early fruits from the south enter their borders without hindrance. There can be no unwholesome competition about it. Absolute free trade in these products is in the interest of everybody. When we have enough of our own Canadian fruits will not seek our markets, and when we lack our usual supply we want all they can send us with no percentage added to pay custom house officers.

We quote again from Mr. Earle's conference with the commissioners as illustrating the embarrassments shrown in the way of trade in perishable fruit:

You will see how many inconveniences and very serious losses are liable to result from the delays which often occur in the passage of fruits from one country to another on account of the imposition of duties. In the case of one of our committee, there were two car loads of apples sent to his house in Chicago at a time when they were quite valuable, two years ago, and they were delayed twenty or thirty days in Detroit because some one in the custom house there supposed that the valuation (it was an *ad valorem* duty) was too small, and no means were taken to correct this valuation until nearly a month had elapsed.

VANDALISM.

A correspondent of the Rural New Yorker says some earnest things about the thieving of fruits:

Within a few days past I have been forcibly reminded (but not for the first time) that there is one phase of fruit culture that has received altogether too little attention, at least in one direction. We are rightly at much pains to collect and diffuse useful information about growing fruit; but what is wanted—sadly wanted—is some kind of reasonable security that the farmer shall have the use and enjoyment of his fruit after he has grown it. It is a lamentable fact, and a disgraceful one, that the stealing of fruit in this country is too generally not regarded as a crime, and to be punished as such. Men who think it dishonorable to steal your purse do not think it dishonorable to steal your fruit. They may be the victims of some kind of casuistry which recognizes a difference between the two acts; but I confess that I am totally unable to perceive it. It is too much for my logic or my common apprehension of right and wrong. We talk a good deal, and to some purpose, about the depredations of insects and birds; but it seems to me to be quite necessary to talk a good deal more, and very pointedly, too, about the depredations of the genus *homo*, who are more destructive and more to be dreaded than the insects and the birds; for I think it could be easily proved that the fruit-grower suffers more in his pocket from men and boys than from insects and birds. It is a misfortune for a fruit-grower to be located near a city, a village, a hotel, or a summer boarding house. I speak from what I have seen and suffered.

LIST OF ANNUAL MEMBERS FOR 1882.

NAME.	P. O. ADDRESS.	COUNTY.
Abbey, Samuel	Spring Lake	Ottawa.
Abbott, John	Lapeer	Lapeer.
Aiken, N. J.	Grand Rapids	Kent.
Acker, Geo. E.	Bay City	Bay.
Allen, Wm. P.	Pleasanton	Manistee.
Allen, J. W.	Hudson	Lenawee.
Allmendinger, G. F.	Ann Arbor	Washtenaw.
Allmand, John	Ann Arbor	Washtenaw.
Aldrich, A. L.	Flint	Genesee,
Alford, Chas.	Grand Rapids	Kent.
Alston, D. G.	Spring Lake	Ottawa.
Alexander, S.	Birmingham	Oakland.
Ambler, W. E.	Pentwater	Oceana.
Andrews, Hiram	Orion	Oakland.
Andrews, Geo. G.	Hudson	*New Hampshire.*
Antisdale, S. G.	Benton Harbor	Berrien.
Armstrong, Wm. L.	Sand Beach	Huron.
Arnold, Lyman	Pleasanton	Manistee.
Ashworth, J.	Lansing	Ingham.
Atkins, Chas. G.	Bucksport	*Maine.*
Atherly, A. J	South Haven	Van Buren.
Avery, Henry	Burlington	*Iowa.*
Badder, G. W.	Ionia	Ionia.
Badder, Mrs. G. W.	Ionia	Ionia.
Badder, Lillie S.	Ionia	Ionia.
Bailey, Rev. Chas. E.	Benzonia	Benzie.
Bailey, M. H.	Dimondale	Ingham.
Bailey, S. S.	Grand Rapids	Kent.
Bandle, J. H.	Saugatuck	Allegan.
Baxter, Albert	Muskegon	Muskegon.
Bacon, N. W.	Holland City	Ottawa.
Ballard, James	Lapeer	Lapeer.
Bangs, C. B. F.	Lansing	Ingham.
Bassett, E. H.	Bay City	Bay.
Bamborough, Jas.	Ionia	Ionia.
Barlow, Wm.	Spring Lake	Ottawa.
Barnes, Henry	Eaton Rapids	Eaton,
Beal, Porter	Geneva	Lenawee.
Beal, Otis	Rollin	Lenawee.
Beal, J. L.	Geneva	Lenawee.
Beartch, Daniel	Holland City	Ottawa.
Beecher, N. A.	Flushing	Genesee.
Beckwith, H.	Spring Lake	Ottawa.
Bevins, J. E.	Le Roy	Osceola.
Bidwell, J. S.	Allegan	Allegan.

NAME.	P. O. ADDRESS.	COUNTY.
Biteley, N. H.	Lawton	Van Buren.
Bellows, E.	Frankfort	Benzie.
Bird, John C.	Ann Arbor	Washtenaw.
Bird, Henry Jr.	Douglas	Allegan.
Birch, Albert	Bay City	Bay.
Briggs, H.	Ann Arbor	Washtenaw.
Birkholen, E.	Benton Harbor	Berrien.
Bixby, T. A.	South Haven	Van Buren.
Bilz, Aloys	Spring Lake	Ottawa.
Blowers, J. M.	Lawrence	Van Buren.
Blakelee, W. W.	Spring Lake	Ottawa.
Boom, S. S.	Eaton Rapids	Eaton.
Booth, O. W.	Bay City	Bay.
Bolgers, H.	Spring Lake	Ottawa.
Bogie, George	Commerce	Oakland.
Bowen, Albert	Wixom	Oakland.
Boice, J. A.	South Haven	Van Buren.
Browne, S. A.	Pentwater	Oceana.
Brown, Thos. L.	Grand Rapids	Kent.
Brown, D. N.	Benton Harbor	Berrien.
Brown, Alphonso	Frankfort	Benzie.
Brown, F. G.	Benton Harbor	Berrien.
Brown, W. A.	Stevensville	Berrien.
Brown, Chas. E.	Yarmouth	*Nova Scotia.*
Bradford, Chas.	Auburn	Bay.
Brassington, James	Hart	Oceana.
Brewer, A. E.	Flint	Genesee.
Brooks, William	Ionia	Ionia.
Brunson, A.	Benton Harbor	Berrien.
Braman, F. S.	Shelby	Oceana.
Branch, F. T.	Maple Rapids	Clinton.
Burridge J. N.	Benton Harbor	Berrien.
Burridge, J.	Benton Harbor	Berrien.
Buck, J. B.	Allegan	Allegan.
Burnett, C. J.	Lapeer	Lapeer.
Butterfield, Walter	Lapeer	Lapeer.
Butterfield, I. H.	Port Huron	St. Clair.
Butler, A. G.	Frankfort	Benzie.
Buell, B. G.	Little Prairie Ronde	Cass.
Buell, Emmons	Kalamazoo	Kalamazoo.
Carpenter, C. R.	Orion	Oakland.
Carroll, E. M.	Pittsford	Lenawee.
Carhart, R. S. G.	Joyfield	Benzie.
Carman, R. A.	Flint	Genesee.
Campbell, J.	Benton Harbor	Berrien.
Campbell, A.	Jackson	Jackson.
Campbell, G.	Holland City	Ottawa.
Campbell, Robert	Allegan	Allegan.
Cahoon, Thomas	Ogden	*Utah Territory.*
Canfield, W. J.	Pentwater	Oceana.
Chambard, P. F.	Fayette	*Ohio.*
Chapman, Geo. P.	Lapeer	Lapeer.
Chapman, Mrs. C. M.	Flint	Genesee.
Chase, A. B.	Bangor	Van Buren.
Church, Mrs. Daniel	Flint	Genesee.
Clark, T. E.	Clinton	Lenawee.
Clark, Wm. S.	Grand Rapids	Kent.
Clifford, Charles	Pleasanton	Manistee.
Cligg, Albert	Eaton Rapids	Eaton.
Coatsworth, John	Holland City	Ottawa.
Cobb, S. S.	Kalamazoo	Kalamazoo.

NAME.	P. O. ADDRESS.	COUNTY.
Cobb, J. T.	Schoolcraft	Kalamazoo.
Cook, S.	Benton Harbor	Berrien.
Cooper, W. S.	Ortonville	Oakland.
Coddington, E. W.	Ann Arbor	Washtenaw.
Collier, M.	Eaton Rapids	Eaton.
Collar, Peter	Adrian	Lenawee.
Coleman, O. N.	Ionia	Ionia.
Comings, S H.	St. Joseph	Berrien.
Comings, Geo. F.	St. Joseph	Berrien.
Courath, Chas.	Ann Arbor	Washtenaw.
Corbett, J.	Ionia	Ionia.
Corbin, C. F.	West Bay City	Bay.
Corbin, A.	West Bay City	Bay.
Corbin, F. L.	Hart	Oceana.
Cornell, C. A.	Ionia	Ionia.
Cornell, Thomas	Ionia	Ionia.
Cornell, L. A.	Ionia	Ionia.
Cornelius, J. M.	Spring Lake	Ottawa.
Connor, Laf.	Sand Beach	Huron.
Conner, Ed. P.	Bay City	Bay.
Corner, Wm.	Ganges	Allegan.
Crumley Robt. A.	Eaton Rapids	Eaton.
Crooks, G. G.	Benton Harbor	Berrien.
Crittenden, L. C.	Benton Harbor	Berrien.
Cross, J. A.	Spring Lake	Ottawa.
Crozier, A. A.	Grand Rapids	Kent.
Cummings, H.	Lapeer	Lapeer.
Curtis, Mrs.	Flint	Genesee.
Cutting, H. D.	Clinton	Lenawee.
Cunningham, J. M.	Benton Harbor	Berrien.
Danville, H. A.	Marilla	Manistee.
Day, James	Benton Harbor	Berrien.
Day, Winslow	Hudson	Lenawee.
Daton, Harvey	Rollin	Lenawee.
Dayton, I. C.	Flint	Genesee.
Davis, J. W.	Adrian	Lenawee.
Davis, H. W.	Lapeer	Lapeer.
Davis, Franklin	Baltimore	*Maryland.*
Dean, James	Muskegon	Muskegon.
Dean, C. T.	Lapeer	Lapeer.
DeCou, Henry F.	Grand Rapids	Kent.
DeHaven, John	Bangor	Van Buren.
Delamere, Charles	South Haven	Van Buren.
DeMotte, J. B.	Greencastle	*Indiana.*
Dempster, J.	Benton Harbor	Berrien.
Dennis, Jno. W.	Lapeer	Lapeer.
Denison, E. B.	Bay City	Bay.
Derim Frank	Spring Lake	Ottawa.
Dickenson, A.	Benton Harbor	Berrien.
Dickenson, W. P.	St. Joseph	Berrien.
Diller, Henry B.	Mt. Morris	Genesee.
Dodds, John	Lapeer	Lapeer.
Doty, J. W.	Benton Harbor	Berrien.
Dumont, J. B.	Allegan	Allegan.
Douglas, E. G.	Lapeer	Lapeer.
Dunham, T. W.	Stevensville	Berrien.
Dunlap, A. S.	Dayton	*Ohio.*
Duncan, Jas	Ann Arbor	Washtenaw.
Dutton, Chas. A.	Holland City	Ottawa.
Dutton, A. H.	Holland City	Ottawa.
Eberts, Peter	Muskegon	Muskegon.

NAME.	P. O. ADDRESS.	COUNTY.
Edmiston, D. G.	Adrian	Lenawee.
Eldred, N. J.	Benton Harbor	Berrien.
Emmons, Wm. K.	Grand Rapids	Kent.
Emory, N. C.	Benton Harbor	Berrien.
Engle, George	Centerville	St. Joseph.
Everhard, J. S.	St. Joseph	Berrien.
Evans, C. L.	Eaton Rapids	Eaton.
Farnum, C. H.	Benton Harbor	Berrien.
Farmer, J. C.	Spring Lake	Ottawa.
Farmer, W. S.	Benton Harbor	Berrien.
Farnsworth, M. B.	Shelby	Oceana.
Fisher, D. A.	Denver	*Indiana.*
Farnam, Rev. W. L.	Flint	Genesee.
Flanders, E. P.	Kalamazoo	Kalamazoo.
Flushing Grange	Flushing	Genesee.
Fox, Jonathan	Spring Lake	Ottawa.
French, Geo. A.	Flushing	Genesee.
Freeman, Mrs. E. O.	Bay City	Bay.
Freeman, Milton R.	Flushing	Genesee.
Freeman, S. A.	Eaton Rapids	Eaton.
Frink, E. D.	Spring Lake	Ottawa.
Francis, Wm. H.	Frankfort	Benzie.
Francis Edward	Bay City	Bay.
Fuller, M. M.	Holland City	Ottawa.
Fuller, S. R.	Eaton Rapids	Eaton.
Gerber, D.	Douglas	Allegan.
Gard, J. F.	St. Joseph	Berrien.
Garver, A. J.	Hart	Oceana.
Garver, B. S.	Hart	Oceana.
Gardner, Eugene	Spring Lake	Ottawa.
Garey, E. S.	Eaton Rapids	Eaton.
Gaylord, A. F.	Eaton Rapids	Eaton.
Gee, Warren	Spring Lake	Ottawa.
Geer, C. L.	Lapeer	Lapeer.
Gebhart, Benton	Mears	Oceana.
Gibbs, T. J.	Adrian	Lenawee.
Giles, E. F.	Muskegon	Muskegon.
Gibson, D. R.	Hudson	Lenawee.
Girdwood, Geo.	Salem	*Ohio.*
Gillette, G. M.	Bergen	*New York.*
Gillette, M. S.	Bergen	*New York.*
Gellet, H. E.	Benton Harbor	Berrien.
Gilbert, W. S.	Mears	Oceana.
Gladden, Wm.	Lansing	Ingham.
Glass, James	Flushing	Genesee.
Goshorn, J.	Saugatuck	Allegan.
Godfrey, C. H.	Benton Harbor	Berrien.
Goodrich, E.	Hudson	Lenawee.
Goodrich, Clara E.	Pittsford	Lenawee.
Goodall, Mrs. A.	Ionia	Ionia.
Graham, H. E.	Douglas	Allegan.
Gray, Dexter	Hudson	Lenawee.
Granger, F.	Benton Harbor	Berrien.
Gregory, G. B.	Lapeer	Lapeer.
Green, Wm.	Eaton Rapids	Eaton.
Green, W. B.	Portsmouth	Bay.
Green, D. G.	Ionia	Ionia.
Griffin, H. C.	Shelby	Oceana.
Griffith, H. D.	Eaton Rapids	Lenawee.
Griffin, Geo.	South Haven	Van Buren.
Gridley, A. L.	Benzonia	Benzie.

NAME.	P. O. ADDRESS.	COUNTY.
Grubb, Samuel H.	Philadelphia	*Pennsylvania.*
Gustin, R. P.	Bay City	Bay.
Guerney, C. A.	Hart	Oceana.
Gulley, A. G.	South Haven	Van Buren.
Hall, Dr.	Royalton	Berrien.
Hall, Frank	Spring Lake	Ottawa.
Hall, T. P.	Detroit	Wayne.
Hall, B. N.	Spring Lake	Ottawa.
Hall, A. N.	Ionia	Ionia.
Hall, Wm. W.	Ionia	Ionia.
Hall, J. R.	Bay City	Bay.
Hall, Josiah S.	Ionia	Ionia.
Hale, David	Eaton Rapids	Eaton.
Halstead, L. L.	Lawton	Van Buren.
Halliday, A.	Stevensville	Berrien.
Haight, J. M.	Shelby	Oceana.
Haines, John S.	Germantown	*Pennsylvania.*
Hamilton, A.	Peach Belt	Allegan.
Handy, S.	Benton Harbor	Berrien.
Harvey, Chas.	Pentwater	Oceana.
Harkstaff, H. A.	Lapeer	Lapeer.
Hartwicke, L M.	Pentwater	Oceana.
Hawley, B. M.	Bay City	Bay.
Hayes, N. B.	Ionia	Ionia.
Hayes, Mrs. N. B.	Ionia	Ionia.
Hazeltine, L. J.	Conneaut	*Ohio.*
Healy, A. D.	South Haven	Van Buren.
Henwood, John W.	Hart	Oceana.
Hevener, John	Lapeer	Lapeer.
Hearth, S. F.	Benton Harbor	Berrien.
Hekhuis, G. J.	Holland City	Ottawa.
Heffron, Edwin S.	Benzonia	Benzie.
Hicks, Caleb	Lapeer	Lapeer.
Heusted, O. H. M.	Holly	Oakland.
Higley, George	Lapeer	Lapeer.
Hills, C.	Laingsburg	Shiawassee.
Hill, A. N.	Stevensville	Berrien.
Hilton, C. E.	Benton Harbor	Berrien.
Hinman, L. W.	Lapeer	Lapeer.
Hitchcock, N. S.	Ionia	Ionia.
Hitchcock, Mrs. N. S.	Ionia	Ionia.
Hiscock, Daniel	Ann Arbor	Washtenaw.
Hoag, C. L.	Lockport	*New York.*
Holmes, Wm. F.	Eaton Rapids	Eaton.
Holmes, R. H.	Lansing	Ingham.
Holmes, A.	Eaton Rapids	Eaton.
Holt, Henry H.	Muskegon	Muskegon.
Hollister, E. T.	St. Louis	*Missouri.*
Hollister, A.	Sammons' Landing	Oceana.
Hopkins, Wm. R.	Springdale	Manistee.
Hopson, John	Sand Beach	Huron.
Hosford, George	Ionia	Ionia.
Hotchkiss, E. C.	Benzonia	Benzie.
Hodgkins, Miss L. A.	Jackson	Jackson.
House, H. L.	Saugatuck	Allegan.
Howard, Sumner	Flint	Genesee.
Howard, Mrs. Sumner	Flint	Genesee.
Howard, D. W.	Pentwater	Oceana.
Hurd, M. G.	Eaton Rapids	Eaton.
Harkness, J. W.	Hudson	Lenawee.

NAME.	P. O. ADDRESS.	COUNTY.
Halburt, Moses	Pleasanton	Manistee.
Hubbell, J. J.	Benzonia	Benzie.
Hutchins, P. C.	Ionia	Ionia.
Inman, Alvan	Lapeer	Lapeer.
Jackson, Wm. A.	Lapeer	Lapeer.
Jackson, R. A.	Benton Harbor	Berrien.
James, A.	Benton Harbor	Berrien.
Jenks, James	Sand Beach	Huron.
Jeffrey, James	Kalamazoo	Kalamazoo.
Jeffers, Alexander	Spring Lake	Ottawa.
Jeffers, J.	Kalamazoo	Kalamazoo.
Jones, J. H.	Coloma	Berrien.
Jones, J. H.	Lapeer	Lapeer.
Jones, Ezra	Lansing	Ingham.
Jones, John	Bay City	Bay.
Jones, R. H.	South Haven	Van Buren.
Johnson, Rollin	Lapeer	Lapeer.
Johnson, F. B.	Lansing	Ingham.
Judson, D.	Benton Harbor	Berrien.
Just, J. N.	Belding	Ionia.
Kay, Chas. M.	Spring Lake	Ottawa.
Keath, Wm.	Muskegon	Muskegon.
Kelsey, Mrs. E. P.	Ionia	Ionia.
Kelsey, Miss Lillie	Ionia	Ionia.
Kelsey, L. M.	Ionia	Ionia.
Kellogg, M. C.	Muskegon	Muskegon.
Keilor, Nelson	Pleasanton	Manistee.
Kent, Albert	Inland	Benzie.
Keyes, James A.	Montague	Muskegon.
Kenney, H. E.	Benton Harbor	Berrien.
Kenney, W. R.	Tecumseh	Lenawee.
Kerkhof, J. M.	Holland City	Ottawa.
Kingston, Job	Ionia	Ionia.
Kingston, Mrs. Job	Ionia	Ionia.
Kingsbury, B. T.	Lapeer	Lapeer.
Kidd, Mrs. J. H.	Ionia	Ionia.
Kibby, J. H.	Douglas	Allegan.
Kitson, Wm.	Ionia	Ionia.
Kittridge, K.	Eaton Rapids	Eaton.
Kitchen, D. H.	Peach Belt	Allegan.
Kies, Joseph S.	Clinton	Lenawee.
Kies, Geo. D.	Clinton	Lenawee.
Kimball, Wm. S.	Clinton	Lenawee.
Kocher, A. M.	Spring Lake	Ottawa.
Knight, Geo. L.	Muskegon	Muskegon.
Knight, Nathan	Bay City	Bay.
Knaggs, J. W.	Bay City	Bay.
Knapp, C. E.	Grand Rapids	Kent.
Lamont, J. P.	Pleasanton	Manistee.
Latherell, John W.	Joyfield	Benzie.
Lazenby, Edward	Cass City	Tuscola.
Law, Geo. W.	South Haven	Van Buren.
Lay, Geo. T.	Allegan	Allegan.
Lawton, C. D.	Lawton	Van Buren.
LeValley, E.	Ionia	Ionia.
LeValley, Mrs. E.	Ionia	Ionia.
LeValley, Ira F.	Ionia	Ionia.
Lemon, P. M.	Pleasanton	Manistee.
Leland, B. F.	Flint	Genesee.
Leland, J. P.	Ganges	Allegan.
Lee, Henry	Lapeer	Lapeer.

NAME.	P. O. ADDRESS.	COUNTY.
Lewis, S. R.	Ganges	Allegan.
Lewis. N. W.	Ganges	Allegan.
Linderbeck, J. W.	Flint.	Genesee.
Linderman, G. S.	Grand Rapids.	Kent.
Linderman, E.	South Haven	Van Buren.
Linderman, Frank	South Haven	Van Buren.
Lindon, Alonzo R.	Clinton	Lenawee.
Lilly, Sam'l	Spring Lake	Ottawa.
Little, John	Granton	*Canada.*
Lockwood, H. C.	Crystal Valley	Oceana.
Loomis, James W.	Ionia	Ionia.
Loomis, Levi	Peach Belt	Allegan.
Louk, W. H., Jr.	Lapeer	Lapeer.
Lord, G. N.	Benton Harbor	Berrien.
Loveday, D. C.	South Haven	Van Buren.
Lombard. Charles	Lapeer	Lapeer.
Lucas, J. J.	Stanton	Montcalm.
Lynch. J. V.	St. Joseph	Berrien.
Lucia, Fred	Flint	Genesee.
Manwaring, Joshua	Lapeer	Lapeer.
Marsilje, Isaac	Holland City	Ottawa.
Marlatt, W. H.	Bay City	Bay.
Marston, Isaac	Bay City	Bay.
Marshall, O.	Lansing	Ingham.
Marshall. C. M.	Spring Lake	Ottawa.
Markham, W. D	Hart.	Oceana.
Markham. B.	Saugatuck	Allegan.
Martin, Joseph	Grand Rapids	Kent.
Mason, Thomas	Chicago	*Illinois.*
Maxwell, T. C.	Geneva	*New York.*
McCalloch, Robt.	Bay City	Bay,
McIntyre, G. A.	Hart	Oceana.
McNamara, Jas.	Lapeer	Lapeer.
McCall, Hugh	Lapeer	Lapeer.
McElroy, T. M.	Lapeer	Lapeer.
McDonell, A.	Bay City	Bay.
McDonald, Jno. N.	Bay City	Bay.
McCoy. Thomas	Walled Lake	Oakland.
McAlister, Jno.	Flint	Genesee.
McClave, A. J.	Benton Harbor	Berrien.
McCulloch, J. A.	Benton Harbor	Berrien.
McLean. Hugh	Spring Lake	Ottawa.
Mead. O. E.	Benton Harbor	Berrien.
Merrill, H. C.	Bay City	Bay.
Merriman, C. N.	Whitehall	Muskegon.
Meisel, Herman	Bay City	Bay.
Merry, H.	Benton Harbor	Berrien.
Metcalf, W. E.	South Haven	Van Buren.
Mickel, E.	Lapeer	Lapeer.
Mickel. J. V.	Ionia	Ionia.
Mitchel, L. B.	Shelby	Oceana.
Millard, J. D.	Pleasanton	Manistee.
Miller, Samuel	Eaton Rapids	Eaton.
Miller, Robert	Battle Creek	Calhoun.
Miller, William	Eaton Rapids	Eaton.
Miller, Harrison	Ionia	Ionia.
Mills, S.	Ann Arbor	Washtenaw.
Monroe, L. S.	South Haven	Van Buren.
Monroe, C. J.	South Haven	Van Buren.
Montgomery, W. H.	Hudson	Lenawee.
Moore, J. B.	Lapeer	Lapeer.

NAME.	P. O. ADDRESS.	COUNTY.
Moore, Geo. D.	Medina	Lenawee.
Moore, W. E.	Goodland	Lapeer.
Morley, John	Flint	Genesee.
Morley, J. W.	Bay City	Bay.
Mower, T. Daily	East Saginaw	Saginaw.
Morrill, R.	Benton Harbor	Berrien.
Morrison, Mrs. J. E.	Ionia	Ionia.
Morrison, A.	Detroit	Wayne.
Morris, Amos	Lawton	Van Buren.
Morse, A. B.	Ionia	Ionia.
Morse, Mrs. A. B.	Ionia	Ionia.
Mukautz, J. V. P.	Manistee	Manistee.
Murphy, Frank	Conneaut	*Ohio*,
Nichols, R. C.	Holland City	Ottawa.
Nichols, Fred	Bay City	Bay.
Nichols, W. W.	Ann Arbor	Washtenaw.
Nichols, Prof. B. E.	Ann Arbor	Washtenaw.
Newberry, Wm.	North Newburg	Shiawassee.
Norton, H. W.	Hudson	Lenawee.
Northrup, N. G.	Eaton Rapids	Eaton.
Nott, W. J.	Benton Harbor	Berrien.
Nordman, E. A.	Lima	Washtenaw.
Olds, A. A.	Decatur	Van Buren.
Olmstead, L. Ney	Ionia	Ionia.
Olison, O.	St. Joseph	Berrien.
O'Mealy, H. M.	Hudson	Lenawee.
Orchardson, Chas.	Spring Lake	Ottawa.
Otting, E. H.	Warren	*Ohio.*
Overholt, W. H.	Mason	Ingham.
Owen, Dr. W.	Adrian	Lenawee.
Owen, J. S.	Douglas	Allegan.
Owen, O. G.	Lapeer	Lapeer.
Pailthorp, R. L.	Mt. Morris	Genesee.
Page, P. L.	Ann Arbor	Washtenaw.
Partridge, B. F.	Bay City	Bay.
Partridge, A. S.	Flushing	Genesee.
Patrick, Miss Sarah	Flint	Genesee.
Parker, N. A.	Frankfort	Benzie.
Parker, F. H.	Berwick	*Nova Scotia.*
Parks, G. W.	Lansing	Ingham.
Parker, Frank	Ann Arbor	Washtenaw.
Parker, Chas. H.	Joyfield	Benzie.
Parker, F. H.	Eaton Rapids	Eaton.
Parsons, E. M.	Terry Station	Bay.
Patterson, Wm.	Benzonia	Benzie.
Peck, S. B.	Muskegon	Muskegon.
Perrine, Sol.	Eaton Rapids	Eaton.
Perham, J. B.	Spring Lake	Ottawa.
Peffer, T. A.	South Bend	*Indiana.*
Pettitt, Thos. B.	Benzonia	Benzie.
Pettitt, James A.	Benzonia	Benzie.
Perry, M. P.	Grand Blanc	Genesee.
Peterson, Chas. A.	Shelby	Oceana.
Peters, W. F.	St. Joseph	Berrien.
Peters, C. W.	Bangor	Van Buren.
Phelps, I. E.	Medina	Lenawee.
Phelps, C. P.	St. Joseph	Berrien.
Phœnix, F. K.	Delevan	*Wisconsin.*
Phillips, W. G.	Eaton Rapids	Eaton.
Pike, Hammond	Lapeer	Lapeer.
Pittenger, J. J.	Milford	Oakland.

NAME.	P. O. ADDRESS.	COUNTY.
Pittenger, A.	Shelby	Oceana.
Piper, A. G.	Ionia	Ionia.
Pierce, Joseph D.	Grand Rapids	Kent.
Pierson, E. I.	Hudson	Lenawee.
Pierson, J.	Ionia	Ionia.
Pierson, E. I.	Flint	Genesee.
Pierson, D. D.	Atlas	Genesee.
Pierson, Mrs. Job	Ionia	Ionia.
Pierson, J. R.	Eaton Rapids	Eaton.
Plummer, W. G.	South Haven	Van Buren.
Pittenger, J. S.	Wixom	Oakland.
Piper, Mrs. H. G.	Ionia	Ionia.
Preston, Hassie H.	Ionia	Ionia.
Preston, Mrs. C. A.	Ionia	Ionia.
Preston, C. A.	Ionia	Ionia.
Purdy, P.	Douglas	Allegan.
Purdy, Thomas S.	Holland City	Ottawa.
Purves, J. H.	Jackson	Jackson.
Putney, Marshall	Gilmore	Benzie.
Putney, Rufus	Gilmore	Benzie.
Racher, A. C.	Shelby	Oceana.
Ragatz, J. H.	Benton Harbor	Berrien.
Ramsdell, J. G.	South Haven	Van Buren.
Randall, Miss D.	Ionia	Ionia.
Randall, Mrs. Sarah S.	Ionia	Ionia.
Rawlinson, J. W.	Grand Rapids	Kent.
Reeves, C. E.	Benton Harbor	Berrien.
Reid, E. C.	Allegan	Allegan.
Reid, Ira	Lapeer	Lapeer.
Reed, Orin	Bloundt	*Dakota.*
Remington, Mark	Bangor	Van Buren.
Reynolds, C. P.	Harrisville	Alcona.
Renther	Salzburg	Bay.
Reynolds, Mrs. Theodore	Bangor	Van Buren.
Rice, Freeman	Lawton	Van Buren.
Rice, Wm.	Ionia	Ionia.
Rice, Mrs. Wm.	Ionia	Ionia.
Rice, James	Eaton Rapids	Eaton.
Rice, John T.	Lapeer	Lapeer.
Richmond, E. D.	Hart	Oceana.
Richmond, C. H.	Ann Arbor	Washtenaw.
Richardson, J. J.	Essexville	Bay.
Riford, A. B.	Benton Harbor	Berrien.
Robinson, T. C.	Owen Sound	*Canada.*
Robinson, Jas. M.	Muskegon	Muskegon.
Robinson, E. C.	Portland	*Maine.*
Rose, John	Portsmouth	Bay.
Rose, Frank	Eaton Rapids	Eaton.
Rowe, Wm. N.	Grand Rapids	Kent.
Rowden, John C.	Auburn	Bay.
Rowden, Sam'l	Auburn	Bay.
Root, Isaac	South Haven	Van Buren.
Root, J. W.	Ionia	Ionia.
Rogers, D. H.	Parma	Jackson.
Rogers, R S.		Lenawee.
Rood, P. N.	Lapeer	Lapeer.
Rosenkrans, C. T.	Flint	Genesee.
Rockwood, C. H.	Flint	Genesee.
Rogge, C.	Benton Harbor	Berrien.
Rowland, Rufus H.	Flint	Genesee.
Ruggles, L. W.	Benton Harbor	Berrien.

NAME.	P. O. ADDRESS.	COUNTY.
Rust, Mrs. C. E.	Ionia	Ionia.
Rust, Miss May	Ionia	Ionia.
Rundell, T.	Bay City	Bay.
Sailor, J.	Saugatuck	Allegan.
Sammons, J. H.	Sammons' Landing	Oceana.
Sanders, Joseph	Pleasanton	Manistee.
Scribner, G. W.	Ionia	Ionia.
Scribner, Miss Lillie	Ionia	Ionia.
Scheurer, John G.	Ionia	Ionia.
Scott, Charles	Holland City	Ottawa.
Seeley, Henry E.	Eaton Rapids	Eaton.
Sebring, Thomas	Shelby	Oceana.
Sessions, Job S.	Spring Lake	Ottawa.
Sessions, Hanson	Ann Arbor	Washtenaw.
Seagrove, Geo.	Spring Lake	Ottawa.
Shaw, H. A.	Eaton Rapids	Eaton.
Sheldon, P. B.	South Haven	Van Buren.
Sheldon, H. N.	Benton Harbor	Berrien.
Sheldon, N.	Ann Arbor	Washtenaw.
Shearer, Geo. H.	Bay City	Bay.
Shiver, C.	Benton Harbor	Berrien.
Shrigley, Eugene W.	Kalamazoo	Kalamazoo.
Silvernail, Mrs. E. W.	Hudson	Lenawee.
Simpson, Wm.	Bay City	Bay.
Sinclair, W. G.	Spring Lake	Ottawa.
Slaght, G. R.	Flint	Genesee.
Smeltzer, Abel M.	Joyfield	Benzie.
Smith, Pliny	Grand Rapids	Kent.
Smith, Henry T.	Kalamazoo	Kalamazoo.
Smith, John S.	Lapeer	Lapeer.
Schmidt, August	Frankfort	Benzie.
Smith, Henry	Grand Rapids	Kent.
Smith, D. D.	Bear Lake	Manistee.
Smith, Erwin F.	Ionia	Ionia.
Smith, T. E.	Ionia	Ionia.
Smith, Mrs. T. E.	Ionia	Ionia.
Smith, M. T.	Allegan	Allegan.
Smith, E. L.	Benton Harbor	Berrien.
Smith, W. A.	Benton Harbor	Berrien.
Smith, Wm. J.	Whitehall	Muskegon.
Snodin, Alex.	Sand Beach	Huron.
Soule, Benj.	Spring Lake	Ottawa.
Southard, W. B.	Kalamazoo	Kalamazoo.
Souter, A. E.	Shelby	Oceana.
Souter, Fred L.	Holland City	Ottawa.
Souter, Geo. H.	Holland City	Ottawa.
Spencer, C. A.	Benton Harbor	Berrien.
Spencer, F. A.	Benton Harbor	Berrien.
Spicer, H. M.	Frankfort	Benzie.
Spaulding, Mrs. Jerry	Ionia	Ionia.
Spaulding, Mont.	Ionia	Ionia.
Spink, R.	Benton Harbor	Berrien.
Spingstun, E. A.	Frankfort	Benzie.
Spencer, F. A.	Benton Harbor	Berrien.
Starr, R. W.	Port Williams	*Nova Scotia.*
Stanton, E. H.	Ionia	Ionia.
Stanton, Mrs. E. H.	Ionia	Ionia.
Stanton, Miss A. M.	Ionia	Ionia.
Steinback, E.	Benton Harbor	Berrien.
Stebbins, C. B.	Lansing	Ingham.
Stewart, David	Eaton Rapids	Eaton.

NAME.	P. O. ADDRESS.	COUNTY.
Stringer, George W.	Lapeer	Lapeer.
Stowell, C. B.	Hudson	Lenawee.
Stowell, Samuel	Ionia	Ionia.
Stevens, J. V.	Springboro	*Pennsylvania.*
Sterling, John	Detroit	Wayne.
Sutton, T. J.	Tecumseh	Lenawee.
Sutherland, John	Kawkawlin	Bay.
Sumner, J. E.	Ann Arbor	Washtenaw.
Slinger, Elijah	Clinton	Lenawee.
Sutphin, B. B.	Allegan	Allegan.
Swift, H.	Lansing	Ingham.
Tanner, S. K.	Allegan	Allegan.
Taylor, J. F.	Douglas	Allegan.
Taylor, Robert L.	Lapeer	Lapeer.
Taylor, S. L.	Ionia	Ionia.
Tenny, Alva	Davison Station	Genesee.
Thayer, R. C.	Benton Harbor	Berrien.
Thompson, W. H.	Chicago	*Illinois.*
Thompson, Jas.	Eaton Rapids	Eaton.
Thorpe, H. B.	Spring Lake	Ottawa.
Toam, Wm.	Ionia	Ionia.
Todd, J. H.	Hudson	Lenawee.
Tower, O.	Ionia	Ionia.
Town, A. C.	Richland	Kalamazoo.
Townsend, Miss Susie	Ionia	Ionia.
Treat, J. J.	Harbor Springs	Emmet.
Tubbs, Mrs. J. H.	Ionia	Ionia.
Turrell, George	Lapeer	Lapeer.
Tuttle, B. A.	Lapeer	Lapear.
Ueberhouse, L.	Portsmouth	Bay.
Van Alstin, Dr.	Ionia	Ionia.
Van Amburgh, D. R.	Joyfield	Benzie.
Van Amburg, Mrs. M. A.	Joyfield	Benzie.
Van Brunt, R. W.	St. Joseph	Berrien.
Van Buren, O.	Grand Rapids	Kent.
Van Deman, J. W.	Benzonia	Benzie.
Van Daine, Adrian	Holland City	Ottawa.
Vandevere, J.	Benton Harbor	Berrien.
Vankuren, J. M.	Flint	Genesee.
Van Ness, J. H.	Ionia	Ionia.
Van Tifflen, Reuben	Flint	Genesee.
Van Tifflen, Mrs. R.	Flint	Genesee.
Vercade, John	Spring Lake	Ottawa.
Visscher, A.	Holland City	Ottawa.
Voorheis, Isaac	Frankfort	Benzie.
Voorheis, Wm. G.	Frankfort	Benzie.
Voorheis, August	South Haven	Van Buren.
Watson, J. H	Benton Harbor	Berrien.
Wadsworth, S. P.	St. Joseph	Berrien.
Warner, Calvin	Flushing	Genesee.
Warner, Wm.	Ann Arbor	Washtenaw.
Waters, H. P.	Lawton	Van Buren.
Walker, A.	St. Joseph	Berrien.
Ward, L. M.	Benton Harbor	Berrien.
Waffle, Chas. L.	Holland City	Ottawa.
Wasson, Chas F.	Spring Lake	Ottawa.
Walsh, Martin	Spring Lake	Ottawa.
Waldron, C. A.	Ionia	Ionia.
Watkins, Hiram	Lapeer	Lapeer.
Wood, W. F.	Muskegon	Muskegon.
Woodbury, John	Lapeer	Lapeer.

NAME.	P. O. ADDRESS.	COUNTY.
Woodbridge, S.	Ionia	Ionia.
Wessen, Leonard	Flint	Genesee.
Wedthoff, A. R.	Bay City	Bay.
Webb, W. E.	Sand Beach	Huron.
Wenzel, V.	Hudson	Lenawee.
Wells, A. L.	St. Joseph	Berrien.
Webster, David	Attica	Lapeer.
Webster, U. B.	Benton Harbor	Berrien.
Webber, S. W.	Ionia	Ionia.
Webber, Mrs. S. W.	Ionia	Ionia.
Webber, A. J.	Ionia	Ionia.
Webber, Mrs. A. J.	Ionia	Ionia.
Wheeler, Mrs. Mary	Flint	Genesee.
White, C. P.	Pittsford	Lenawee.
White, H. K.	Lapeer	Lapeer.
White, C. G.	Lapeer	Lapeer.
White, M. S.	Delhi Mills	Washtenaw.
White, F.	Benton Harbor	Berrien.
White, C. K.	Rothbury	Oceana.
Whitehead, C. W.	Benton Harbor	Berrien.
Whitehead, F. J.	Benton Harbor	Berrien.
Whitelark, Mrs. Lucy	Ann Arbor	Washtenaw.
Whitelark, J.	Ann Arbor	Washtenaw.
Williams, A. C.	Lincoln	*Nebraska.*
Williams, M. B.	Kalamazoo	Kalamazoo.
Williams, E. R.	Ionia	Ionia.
Williams, M.	Spring Lake	Ottawa.
Williams, Jno. W.	Webster	Washtenaw.
Williams, Jno.	Kalamazoo	Kalamazoo.
Willard, S. D.	Geneva	*New York.*
Wirt, Wm. F.	Hudson	Lenawee.
Windows, J.	Kalamazoo	Kalamazoo.
Winters, M. I.	Eaton Rapids	Eaton.
Wiley, D. W.	Douglas	Allegan.
Whitney, Jas. H.	Muskegon	Muskegon.
Wilder, S.	Harlem	*Indiana.*
Witterling, M.	Ionia	Ionia.
Winkley, Wm.	Flint	Genesee.
Wilcox, Jas. M.	Flint	Genesee.
Wilson, Geo. H.	South Frankfort	Benzie.
Wilson, Geo.	Benton Harbor	Berrien.
Wood, Allen	Allegan	Allegan.
Wooldridge, Miss May	Ionia	Ionia.
Woodward, J. S	Lockport	*New York.*
Woodward, H.	Frankfort	Benzie.
Woodhull, A. E.	Sand Lake	Kent.
Woodruff, C. H.	Ann Arbor	Washtenaw.
Woodruff, H. A.	Benton Harbor	Berrien.
Woodruff, A. N.	Benton Harbor	Berrien.
Woodruff, H. D.	Auburn	*New York.*

SUMMARY OF ANNUAL MEMBERSHIPS IN THE STATE HORTICULTURAL SOCIETY FOR 1882.

Allegan county	30
Alcona “	1
Bay “	42
Benzie “	29
Berrien “	80
Cass “	1
Calhoun “	1
Clinton “	1
Dakota	1
Eaton county	30
Emmet “	1
Genesee “	41
Huron “	5
Ionia “	80
Ingham “	12
Indiana	4
Illinois	2
Iowa	1
Jackson county	4
Kalamazoo “	13
Kent “	17
Lapeer “	49
Lenawee “	40
Manistee “	14
Muskegon “	15
Montcalm county	1
Maine	2
Maryland	1
Missouri	1
New Hampshire	1
New York	7
Nebraska	1
Nova Scotia	3
Ottawa county	52
Oakland “	10
Oceana “	31
Osceola “	1
Ohio	5
Ontario	2
Pennsylvania	3
Saginaw county	1
Shiawassee “	2
St. Joseph “	1
St. Clair “	1
Tuscola “	1
Utah	1
Van Buren county	34
Washtenaw “	24
Wayne “	3
Wisconsin	1

LIFE MEMBERS OF THE STATE HORTICULTURAL SOCIETY.*

Adams, H. Dale, Galesburg, Kalamazoo county.
Adams, Mrs. H. Dale, Galesburg, Kalamazoo county.
Allis, E. W., Adrian, Mich.
Allis, Miss Mary C., Adrian, Mich.
Archer, Thomas, St. Joseph, Berrien county.
Armitage, James, Monroe, Monroe county.
Arnold, W. D., Ionia, Ionia county.
Avery, C. P., Old Mission, Grand Traverse county.
Ball, John, Grand Rapids, Kent county.
Baldwin, H. P., Detroit, Wayne county.
Baldwin, J. D., Ann Arbor, Washtenaw county.
Baxter, W. J., Jonesville, Hillsdale county.
Becker, Albert J., Saginaw, Saginaw county.
Bradfield, Edward, (deceased), Ada, Kent county.
Bagley, John J., (deceased), Detroit, Wayne county.
Beal, W. J., Lansing, Ingham county.
Bates, T. T., Traverse City, Grand Traverse county.
Bruchner, George W., Monroe, Monroe county.
Bragg, L. G., Kalamazoo, Kalamazoo county.
Burham, W. P., Ionia, Ionia county.
Burrows, George L., Saginaw City, Saginaw county.
Bullock, R. D., Jackson, Jackson county.
Bidwell, H. E., Plymouth, Wayne county.
Bailey, L. H., South Haven, Van Buren county.
Bryant, C. T., South Haven, Van Buren county.
Castello, George, Saginaw City, Saginaw county.
Chandler, Z., (deceased), Detroit, Wayne county.
Cook, A. J., Lansing, Ingham county.
Cook, W. N., Grand Rapids, Kent county.
Curtis, H. W., Old Mission, Grand Traverse county.
Chapman, H. B., Reading, Hillsdale county.
Chapman, Alvin, Bangor, Van Buren county.
Chapman, Austin B., Rockford, Monroe county.
Chilson, Nathaniel, Battle Creek, Calhoun county.
Chilson, Miss Ida, Battle Creek, Calhoun county.
Crosby, M. S., Grand Rapids, Kent county.
Cooper, George S., Ionia, Ionia county.
Cooley, Elisha, (deceased), Jackson, Jackson county.
Clark, M. W., Jackson, Jackson county.
Cushman, E. H., Euclid, Ohio.
Dickinson, G. W., Grand Rapids, Kent county.
Dietrich, C. J., Chicago, Ill.
Dorr, S. W., Manchester, Washtenaw county.
Dyckman, A. S., South Haven, Van Buren county.
Dykman, J., East Saginaw, Saginaw county.
De Lisle, Wm. H., Bay City, Bay county.

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*NOTE. A Life Membership is $10. The fund thus gathered is invested in good securities and only the interest employed for general purposes.

Dixon, A. S., East Saginaw, Saginaw county.
Doyle, Thomas, Monroe, Monroe county.
Dean, A. J., Adrian, Lenawee county.
Davis, P. C., Kalamazoo, Kalamazoo county.
Dieckman, Mrs. Josephine M., East Saginaw, Saginaw county.
Fields, Miss Jennie E., East Saginaw, Saginaw county.
Fuller, S. L., Grand Rapids, Kent county.
Ferry, T. W., Grand Haven, Ottawa county.
Foster, W. D., (deceased), Grand Rapids, Kent county.
Foster, Mrs. Mary E., Ann Arbor, Washtenaw county.
Fowler, S. W., Manistee, Manistee county.
Garfield, Chas. W., Grand Rapids, Kent county.
Gibson, Mrs. W. K., Jackson, Jackson county.
Griggs, George W., Grand Rapids, Kent county.
Gilbert, John, (deceased), Ovid, Clinton county.
Geddes, David, Saginaw, Saginaw county.
Greening, J. C., Monroe, Monroe county.
Guild, E. F., East Saginaw, Saginaw county.
Humphrey, J. W., South Haven, Van Buren county.
Hannah, Perry, Traverse City, Grand Traverse county.
Haviland, J. B., (deceased), Traverse City, Grand Traverse county.
Husted, James D., Lowell, Kent county.
Husted, Noah P., Lowell, Kent county.
Hall, Frederick, Ionia, Ionia county.
Hathaway, B., Little Prairie Ronde, Cass county.
Hanford, H. B., Bristol, Indiana.
Hayden, Mrs. H. A., Jackson, Jackson county.
Ilgenfritz, I. E., Monroe, Monroe county.
Ilgenfritz, C. A. Monroe, Monroe county.
Ives, Caleb, Monroe, Monroe county.
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